AMERICAN JOURNAL of VETERINARY MEDICINE

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PUBLISHED MONTHLY. CHICAGO, U. S. A.

VOL. XIV MAY, 1919 No. 5

Erroneous Impressions of Certain Federal Activities

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MAY I not request a few minutes' indulgence from the readers of the recent March issue of the AMERICAN JOURNAL OF VETERINARY MEDICINE in order to correct several inadvertences and misapprehensions which appear in that number concerning certain activities and policies of the Bureau of Animal Industry? I shall refer first to the comments made in connection with tuberculosis eradication work on page 124 and will then briefly discuss the hog cholera and county agent inadvertencies.

Tuberculosis

The paper bearing the title "Protecting a Ten-Billion Dollar Industry," which was printed in the February edition of the above mentioned Journal, contained historical facts concerning the activities of the Bureau from its creation to the present day and no apologies are offered for any of the statements made therein.

It is a matter of very much regret, however, that any colleague should find it so perplexing to lend his support to an effort which was being made to assist the personnel of the veterinary branch of the Bureau in obtaining a fair and just increase in compensation. It is difficult to understand why, even though an individual might consider that his private interests were being somewhat jeopardized by a public work, he would withhold any assistance he could proffer for the uplift and improvement of his fellow professional worker. The underpaid veterinary inspectors, who by the way are in no way responsible for Bureau policies, appear to our Wisconsin friend "to be afraid to trust a practitioner, so why should they look for any (support) in return?" This expression is predicated on an erroneous premise in connection with our accredited herd work. It is assumed at the outset that the Bureau is conducting the campaign single-handed, whereas the work is a cooperative one and is done only jointly with the live stock sanitary officials of each state and with the live stock owners of the respective states.

The general work on tuberculosis eradication is carried on in the United States by reason of an appropriation made by Congress at the solicitation of the live stock interests of the nation. If tuberculosis were confined to only a few localities and were of minor importance to the nation, congress would not have become interested in it and no fund would be provided to carry on measures to control and eradicate it. It is not, however, an insignificant disease which affects only an infinitesimal number of animals here and there, and which may be controlled at will. The fact of the matter is that tuberculosis has been too lightly treated for the past twenty-five years by everyone concerned, and in consequence it has increased to the point where it is now a great economic problem.

Ten years ago the percentage of tuber-

culosis found among swine at the official abattoirs of the United States was approximately two per cent, whereas at the present time it is approximately ten per cent, an increase of nearly one per cent annually. Shall the live stock interests of the nation close their eyes to that fact and continue to depend upon the individual effort of live stock owners and private veterinarians to check its onward progress? What assurance can there be given that tuberculosis will be controlled under such conditions in view of the fact that it is ever increasing? To what point should it be allowed to progress among our food producing animals before the nation is aroused to its insidious advances? Is it time to undertake to control tuberculosis officially when it is admitted that in some states it exists in at least thirty-three per cent of the bovine population, or shall it be permitted to go on, relying only upon individual effort to check it? The eradication of tuberculosis is a national problem and necessarily must be placed under the control of organized bodies which have the authority, funds, and facilities to cope with the situation.

The eradication of tuberculosis and the accrediting of herds that have officially been found free from the disease is not required by any regulation of the Bureau of Animal Industry, as will be gleaned from a casual perusal of the uniform methods and rules prescribed for that plan. The plan was unanimously adopted by the United States Live Stock Sanitary Association and by representatives of pure-bred cattle breeders' associations at the annual meeting held in Chicago, December 2 and 3, 1917. The plan was adopted before it was even presented to the Bureau of Animal Industry for approval. Each section of the plan was carefully reviewed, discussed and adopted from the preamble to the final paragraph, by the sanitary officials in practically every state of the Union. Our critic asks the question, "Why is the local practitioner prohibited from doing this work?" and then endeavors to place the responsibility on the Bureau by answering: "The B. A. I. men seem to be afraid to trust a practitioner. . . . . ." As a matter of fact, the statement in the accredited herd plan to the effect that the tuberculin test for accredited herds should be made by a Bureau inspector or a regularly employed veterinarian of the state, was not accepted by the Bureau until December 23, 1917, after it had been formulated by the joint committee already mentioned and adopted by the United States Live Stock Sanitary Association on December 4, 1917. After the plan had been in operation for one year, practically the same representatives of the various interests involved again met in Chicago for the purpose of discussing what changes, if any, should be recommended, and as a result of that conference the only modification made was to include grade herds of cattle for certification to the accredited list in addition to pure-bred herds. An endeavor was made by several to have private practitioners accepted for accredited testing but without success.

The consensus of opinion of not only live stock sanitary officials, but of live stock owners, the breeders of pure-bred as well as grade cattle, has been from the outset that before herds of cattle should be accredited it should be known officially that they were free from tuberculosis. The Bureau has no regulation at the present time requiring that a herd must be accredited or that cattle intended for interstate shipment must be tuberculin tested except those from tuberculosis herds. There are absolutely no coercive measures employed by the Bureau to have owners place their herds under supervision. What is being done, however, is to afford the owners the opportunity, as was intended by Congress, to have their herds tested and if found affected with tuberculosis to receive aid in freeing them from that disease.

The number of cattle tuberculin tested monthly by employes of the various states and the Bureau is but a drop in the bucket compared with the total number of cattle of any state. During January, 1919, less than thirty thousand cattle were tuberculin tested by the co-operating forces. Therefore, the statement that the Bureau is infringing on the "field, the rights, privileges, and perquisites of the general practitioner" seems far fetched. The Bureau has entertained the idea since tuberculosis eradication work was started that the campaign would call the attention of the live stock owners throughout the nation to the fact that it was considered practicable and important that herds should be tuberculin tested to determine whether or not the disease was present. It further believed that

more interest would be aroused among the owners of herds, in the tuberculin test, than ever before existed and that, therefore, the work of the private practitioner would be stimulated. I am not a seventh son, but I do not hesitate to prophesy that the practitioners of Wisconsin and many other states will do more tuberculin testing in the next three years as a direct result of the present tuberculosis campaign than they did in the last decade. Editor Campbell made a very strong point on this feature of the work when he wrote that it was just as necessary to have the Bureau popularize tuberculosis control work as it was for it to establish confidence in the possibilities of hog cholera eradication several years ago. And the same comment could be made with reference to other diseases.

Attitude of the Bureau

As an indication of the attitude of the Bureau in this matter attention is called to the published and written statements of this office which advocate the desirability of practitioners testing out herds whenever and wherever possible preliminary to turning them over to the Bureau and state authorities for accrediting according to the adopted plan. It is my idea that these herds should subsequently be turned back to the practitioners to be kept clean under such supervision of federal and state officials for check testing as they may deem necessary. There has been some question as to when the return of these herds should take place, but judging from the impetus which the accredited work is receiving, I feel satisfied that shortly the new herds will be coming in so fast as to make it compulsory to release the old accredited herds to the supervision of those in private practice who can be depended upon to carry out the requirements of the accredited plan.

The foregoing contemplated provision for co-operation with the private veterinarian should dispel any apprehension which may exist in the mind of any practitioner that the Bureau has any designs to monopolize any of his "rights, privileges and perquisites."

As further evidence that the practitioner is not being discriminated against by the Bureau, I might cite the fact that regulations are now being prepared which are intended to offer a greater protection against the spread of tuberculosis through interstate shipments. These regulations will require tuberculin test charts showing freedom from tuberculosis for all breeding and dairy cattle which enter interstate commerce for purposes other than immediate slaughter. These tuberculin tests may be applied by any veterinarian whose competency and reliability are certified to by the authorities of his state, or applied by a veterinary inspector of the Bureau at public stockyards or other regular Bureau stations. The Bureau does not contemplate detailing veterinary inspectors to go to farms to test parts of herds so as to facilitate their movement interstate. Such testing should be done by private veterinarians under the supervision of the state. It is proposed, however, that a veterinarian who is recognized by his state for tuberculin testing shall be acceptable to the Bureau and if at any time it is found that any approved veterinarian wilfully violates the regulations for conducting a proper test his name will be stricken from the list as not an acceptable person to do that work.

Of course this does not mean that the Bureau can compel the authorities of any state to accept the tests of the practitioners of another state—that remains to be decided by the state of destination. Without discussing the merits of the case, it is a matter of record that some six states have imposed restrictions against the tests of practitioners in four other states. As my colleague's state is included in the list of four states, probably he would like to blame the Bureau for this also. The need for such state requirements is unfortunate and no one regrets it more than I, as the integrity of the innocent is impugned with that of the guilty. However, there is one feature about these state restrictions that no doubt is pleasing to my friend and that is they are based on local conditions and do not attempt "to make uniform requirements to fit all cases," as he complains the Bureau is doing. Notwithstanding this viewpoint I wish to assert that when state regulations have been made uniform throughout the forty-eight states, the live stock industry throughout the land will arise with one accord and call us blessed.

The function of the Bureau of Animal Industry is to aid in the control and eradication of infectious diseases of live stock wherever found. Its purpose is to be of assistance to the live stock owners of Amer-

ica, to develop, perpetuate, and conserve the rich inheritance that has been bestowed upon us by the possession of a "Ten-Billion-Dollar Industry." The nation will not tolerate quibbling about whose "rights, privileges and perquisites" are infringed upon if tuberculosis is permitted to run rampant throughout the land. The disease must be controlled, and now that the campaign has been launched and is in operation in practically all of the states of the Union it behooves not only the live stock owners but the veterinarians at large to support it with all their vigor and persistency. As a matter of fact, the large majority of veterinarians and live stock owners are lending their hearty support to the work.

The Dorsey Case

In another article about the James Dorsey tuberculosis case, it is stated that the attention of the live stock sanitary authorities and the United States Department of Agriculture was called to Dorsey's methods over and over by practitioners before the authorities would believe that animals shipped with tuberculin test charts that looked O. K. were other than healthy. I am somewhat surprised at this statement and do not know on what information it is based. An examination of the correspondence on file in this Bureau does not reveal any evidence showing that the Department failed to take cognizance when its attention was called to the questionable tuberculin test charts that accompanied his shipments.

On the other hand, the files do show that during the year 1910 and thereafter, the Bureau was in correspondence with various state and Bureau officials, also attorneys located in different sections of the country, in regard to cattle shipped by Dorsey that reacted to the tuberculin test on arrival at destination. Immediately on receipt of information that the test charts furnished by Dorsey were under suspicion, efforts were made by the Bureau to obtain information with a view of prosecuting him if it was found he had violated the federal laws and regulations governing the interstate shipment of animals *known* to be affected with a contagious disease. Secret service agents of the Department and other Bureau representatives were sent out to investigate specific cases reported, but in no instance were they able to obtain sufficient evidence to start prosecution under existing law, which prohibits the interstate shipment of diseased animals but requires the government, in order to maintain prosecution, to prove knowledge of the diseased condition of the animals on the part of the shipper.

The live stock sanitary authorities were requested to report the number of shipments from Dorsey that had entered their respective states since the beginning of the year 1909 and many of the back shipments were traced and retested. The Bureau also suggested that in future when a state was convinced that tuberculin tests were unreliable they should notify the state authorities where the tests were made and refuse thereafter to receive any shipments certified by the veterinarian at fault. The Bureau representatives located at Chicago and other shipping and transfer points were alive to the situation and made it a practice to report the shipments by Dorsey which came to their attention and the state authorities at destination were notified. In many instances the retests were made by veterinary inspectors in the employ of the Bureau; most of the reactors were slaughtered in official establishments, and in a number of instances the Bureau veterinarians who conducted the tuberculin retests and postmortem examinations on reactors, were summoned as witnesses in cases where Dorsey was being prosecuted.

Dorsey's largest business was conducted during 1912 and 1913, and the activities of the Bureau and states against him became so pronounced that by 1914, twelve states were refusing to receive dairy cattle shipped from Illinois unless accompanied by a Bureau certificate and test chart. The warning against cattle shipped from Illinois which appeared in *Hoard's Dairyman* of December 1, 1913, and the refusal of that publication to continue his advertisements, proved very helpful in protecting the live stock industry, and Dorsey's nefarious business was finally curtailed when the Bureau and former State Veterinarian Dyson placed a co-operative federal and state quarantine on five counties, including the Dorsey farm in northern Illinois, on October 1, 1914. It is gratifying to know that such a wilful violator of the law is finally receiving the punishment that is so justly due him. From the time the first reports of his suspicious tuberculin tests were re-

ceived by the Bureau, persistent efforts were made to secure evidence that would convict him under existing law, and it was not due to any lack of effort on the part of the Bureau that he did not land in the penitentiary nine years earlier.

Hog Cholera

On page 148 of the Journal, a statement is made that the Bureau requires that virus-producing hogs "should be absolutely free from any pathological lesions." This is inaccurate, as Circular Letters 669 and 677 will show. Pigs producing both simultaneous and hyperimmunizing virus must show lesions of cholera in at least two organs or tissues, and they must show symptoms of cholera before they are permitted to be killed for the production of virus.

Again, it is stated that "serum producers have absolutely lost their individuality. They are merely making serum according to the man who reads about it in a book." This statement is not in accordance with the facts. It is within the knowledge of the Bureau that practically all manufacturers have certain individual methods in use at their establishments. We do not make an effort to discourage individuality. Inspectors detailed to serum plants are not permitted to make individual inspections until after they have demonstrated their fitness for this work and their familiarity with the regulations and the principles covering the preparation of anti-hog-cholera serum, and hog-cholera virus. In contrast to this fact, individuals have engaged in the production of serum and virus without having previously acquired a working knowledge of this business.

It is also said that virus-producing pigs must come on the premises without any elevation of temperature. This statement differs from the two preceding in that it is in accordance with the facts. Only healthy animals may be brought on to the premises of licensed establishments. It has definitely been shown that it is dangerous to permit the entrance of any animals which are not healthy. This regulation was promulgated not only to protect the manufacturer from a probable permanent loss of his business, but also to protect the live stock industry of the country. For example, if hogs sick of hog cholera were permitted to enter licensed establishments, such diseases as foot-and-mouth disease might be masked by the symptoms of cholera exhibited by these sick animals. In fact the experience of 1914 bears out this statement. Further, it has been shown that in addition to the danger of using virus from such hogs, potent serum will not be produced as regularly as when virus of known virulence, obtained from pigs inoculated at the plant, is used.

With regard to the statement that virus-producing pigs must be killed at a certain time "regardless of whether or not the producers think they are ripe," the facts are that the greatest latitude consistent with safety is given the producer. So far as simultaneous-virus-producing pigs are concerned, they must become visibly sick of hog cholera within seven days and sick to a degree sufficient to result in death within fifteen days after inoculation. With regard to pigs used in the production of hyperimmunizing virus, there is no limitation based on the time when they shall be killed, except that pigs which sicken within three days after inoculation are not to be used. Experience of the Bureau has shown that licensed serum producers will, of their own volition, discard the blood of pigs which show lesions of chronic cholera or of a complicating disease, as the use of blood from such pigs will result either in a large loss of hyperimmunes or the production of non-potent serum.

The last part of this statement appears to be devoted to a comparison of the serum produced at the present time with that formerly produced by manufacturers. The records of this office will show that good results uniformly are obtained by the use of the present day serum, whereas prior to the enactment of the Virus-Serum-Toxin law of 1913, and immediately thereafter, before the inspection service could be organized, many reports regularly reached Washington showing that worthless or dangerous serum was being marketed. In fact the law was passed to correct these conditions and protect the live stock industry.

County Agents

In the problem of controlling infectious diseases of live stock, it has been recognized that a plenary measure of co-operation is necessary at all times. This involves the moral, if not the active support of every agency interested in the amelioration of live stock conditions, and that, in turn, in-

cludes farmers, stockmen, veterinary practitioners, the buyer, the consumer, the agricultural institution and particularly the authorities in the state charged with the application and enforcement of laws, and regulations governing the movement of infected animals, prevention of the spread of infection, and the application of quarantine measures.

In the early stages of Bureau efforts to control and eradicate hog cholera, particular attention was given to the educational phase of the work, with the knowledge that this was necessary as a preliminary effort to encourage the adoption and support of intensive activities at the proper time. For a considerable period nearly the entire scope of the project was educational in character, consisting of lectures to farmers and others describing the disease, its history, its rapid spread, methods of transmission, its effect regarding losses, and its importance as a factor in hampering the development of the swine industry; demonstrations in the judicious use of anti-hog-cholera serum; instructions in proper methods of prevention, including the cleaning and disinfecting of premises. The county agent proved a valuable asset in this work, particularly in the work of organizing communities and arranging for assemblies and meetings of farmers.

Education having accomplished its aim, namely, the dissemination of information in general, and demonstrations and experiments having convinced the majority of swine growers that hog cholera is a preventable disease the control of which is possible through sanitation and the preventive serum treatment, more attention was then directed to the problem of establishing regulatory projects. The major portion of these activities was taken up and conducted in co-operation with live stock boards, departments of agriculture, health commissions, etc., of various states which were legally constituted and vested with power to enforce regulations pertaining to the investigation of outbreaks, application of quarantine and compulsory disinfecting of contaminated premises. Even under this plan of intensive efforts, a limited amount of educational work has been incorporated and is conducted by extension forces of agricultural colleges in the states involved, the Bureau thereby seeking to retain the co-operation of these institutions, agreements being entered into by the colleges and regulatory authorities of states and the Department of Agriculture, covering the scope of efforts devolving upon each co-operating agency.

For a time confusion existed as to the line of demarcation between regulatory and educational functions. In order to eliminate contention on this score, a meeting of representatives of agricultural colleges, and state live stock boards was arranged by the Secretary of Agriculture and held at St. Louis, Missouri, January 12, 1918, where Dr. Hess and I represented the Bureau. At this time a definite understanding was reached between those present as to what constituted educational and regulatory activities. Project agreements covering the work have been prepared and entered into on the basis of this understanding, which are intended to govern the efforts of county agents in hog cholera work, since such agents are joint employes of the Department of Agriculture and of the state institutions concerned. These agreements provide in part that:

Bureau veterinarians, county agents, and other extension workers engaged in educational work shall not hold themselves ready or willing to treat diseases of live stock as a matter of economy or favor for any individual in particular. They shall be definitely instructed not to administer the serum and virus treatment (simultaneous inoculation), for hog cholera unless authorized by the proper authorities of the state and not then except for demonstrational purposes.

It is agreed by the parties to this project that all outbreaks of contagious and infectious disease, such as hog cholera, coming under the observation of the Bureau veterinarians engaged in educational work, and agricultural extension workers, shall be reported immediately to the state veterinarian or his deputies, and that the Bureau veterinarians assigned to this class of work shall submit to the state department of agriculture copies of their weekly reports showing daily activities.

In addition the Department has also outlined the following general policies to be pursued by county agents in their relation to animal diseases:

The states' relations service and the extension divisions of the states are to instruct county agents not to treat animal diseases generally free of charge, whether qualified to do so or not. The mere treatment of hogs for cholera in a more or less wholesale way by county agents is not educational work and is not approved except under rare circumstances. Preventive hog cholera treatment is to be limited to treating hogs only for demonstrational purposes.

County agents should not be permitted, under any circumstances, to take up the actual enforcement of quarantine regulations, to engage in the use of tuberculin, mallein, or other scientific method of diagnosis which is under regulatory supervision in the state, or enforcement of law regarding compulsory treatment, or any other police or regulatory provision of law, or any other regulatory work of the live stock sanitary board of the state, unless authorized to do so in writing by the live stock sanitary board of the state.

County agents should know how to administer the serum alone treatment for the suppression and prevention of hog cholera. The county agent should use this treatment only for the purpose of showing farmers how to administer the serum, or in other words, giving a demonstration. He may, when qualified to do so, teach farmers how to administer the serum. He should organize and instruct farmers so that they may obtain the services either of a veterinarian where possible or some member of their own association for the treatment of all hogs with the serum alone treatment, but he should not hold himself out as willing, ready or able to treat all hogs upon application. His chief work is to organize such activity among farmers that they will take care of the treatment of their livestock diseases either by individual or community effort.

In all joint meetings or education work, the veterinarian will have the exclusive handling of the subject of cholera and other diseases, and the county agent and other extension workers the handling of other allied subjects of animal industry and general farming.

Notwithstanding our constant endeavor to adjust these matters by correspondence or otherwise when failure to comply with the above requirements is reported to us, the statement is made on page 148 that, "there has been no concentrated effort on the part of the B. A. I. to assist in this matter." Kindly refer to the Journal of the A. V. M. A., December 15, 1916, page 491, for additional proof of our efforts along this line. Fortunately, the complaints which have reached this office regarding the veterinary activities of county agents have been gradually reduced in number. In fact, my information indicates that in a number of states this problem has been entirely solved, while the principal agitation now is confined to only a few states. So it seems to me that this question is very largely in the hands of the state authorities, for if one state law permits farmers and others to use virus and the state veterinarian in another state wishes the county agent to perform the double treatment for hog cholera, the Bureau must abide by the statutes and regulations of those states. The county agent is a legalized officer and has come to stay. Differences of opinion should be adjusted and teamwork between veterinarian and county agent should be as possible in one state as in another.

The fundamental idea of the creation of the county agent was to direct farm activities. It was not to investigate but to interpret investigations. It was not to bring personal service, but practical facts to "puzzled tillers of the soil." It was intended to stimulate, guide, and direct intelligent and productive effort by individual touch. It would be just as improper for him to spray Jones' apple trees every month as it would to immunize all his hogs every year. The county agent has been very appropriately termed the "farmers' business adviser." Many of our counties have employed agents of this character; some of them have not, but this is a condition which I feel certain will cure itself in time.

The Bureau in its field work for the elimination of infectious diseases of animals has always been diligent in its care to avoid interfering with the practicing veterinarians in their profession; in fact, it has endeavored to enlist their support and co-operation, and I know that the entire Department is opposed to any of its employes infringing upon the rights of others. However, county agents are directly responsible to the directors of extension of agricultural colleges and suggestions by the Department concerning the conduct of these agents have to be taken up through these directors and their attitude has been very gratifying where specific cases have been brought to their attention. It is well recognized that personal service to farmers by county agents is not consistent with the policy of doing the most good for the most people. More general and lasting benefit would accrue to a community from a demonstration in proper plowing before a gathering of farmers than to plow the entire field for an individual. From the paragraphs of project agreements heretofore quoted, this is the object sought in restricting them (the county agents) to limited activities in the administration of the serum alone treatment for hog cholera, as well as providing for proper authority in the use of serum and virus, and that for demonstration purposes only to assemblies of farmers, hog-growers, and others. The Bureau has

been consistent in endeavoring to prevent laymen, regardless of their affiliation, from engaging in the practice of veterinary medicine, but it is not within its province to dictate to anyone within a state. I have always relied on the efficacy of state laws to eliminate or restrict factors inimical to the best interest of the community and a class of qualified and legally accredited professional men. I feel confident that all fair-thinking veterinary practitioners will agree that criticism of the Bureau for faults that lie wholly with local agencies to rectify is unfortunate and uncalled for.

I desire to acknowledge frankly that mistakes have been, and undoubtedly will be made by the Bureau in the future, but despite this fallibility, the fact remains that it is performing a tremendous job in a way that seems to be generally appreciated, and the veterinary profession as a whole deserves most of the credit.

I am not unduly sensitive to criticism, but in these days when a committee of the A. V. M. A. is preparing a history of our profession, it seems highly desirable for all of us to state only facts and not figments of the imagination.

Secondary Invaders and Their Relation to the Filtrable Virus*

By G. A. JOHNSON, Sioux City, Iowa

IN order that we may arrive at a clearer view of the relation the so-called secondary invaders to the filtrable virus of hog cholera, it might be well to briefly review the history of "hog cholera."

In 1878[1] Congress appropriated $10,000 to carry on research work on the diseases of swine, but it was not until 1885 that Drs. Salmon and Smith discovered a micro-organism that they named B. suipestifer, which they believed to be the cause of an intestinal trouble to which they gave the name hog cholera.

In 1886[2] these same investigators discovered another condition in swine, which they termed "swine plague" and from which they isolated a germ they named B. suisepticus, believing it to be the causative agent.

While many of the results recorded by these investigators were undoubtedly due to the filtrable virus, their work, and later that of others, has demonstrated that under favorable conditions certain strains of these organisms will produce fatal diseases in swine, characterized by the lesions described by these investigators. In fact, their work was so extensive and thorough, that their theories were quite generally accepted until 1903[3], when Drs. DeSchweinitz and Dorset, also of the B. A. I., demonstrated that a highly fatal disease could be transmitted from hog to hog with a virus from which all known micro-organisms, including the B. suipestifer and B. suisepticus, were removed by passing it through very dense porcelain filters.

From the time the work of Drs. De Schweinitz and Dorset was accepted, until quite recently, it was generally accepted and believed that there was but one transmissible disease prevalent among swine in this country, and that one was due to the filtrable virus.

Viewpoint Changes

Thus the pendulum of the theory swung from the swine plague and the hog cholera view, to the extreme of the filtrable virus only, to the exclusion of all other diseases and complications, notwithstanding the fact that Drs. Salmon and Smith, and others, had demonstrated that both B. suipestifer and B. suisepticus in pure culture are pathogenic for swine under favorable conditions. And it was not until anti-hog cholera serum (which, by the way, was also developed by the B. A. I.) had been tried beyond the experimental stage, that the theory of only one transmissible disease began to be questioned.

We are all more or less familiar with this phase of the subject, but it may be ques-

*Presented at the 31st Annual Meeting of the Iowa Veterinary Association, Ames, Jan., 1919.

[1]Hog Cholera. Special Report, Bureau of Animal Industry, 1889.

[2]Cause and prevention of swine plague, Special Report, Bureau of Animal Industry, 1891.

[3]Pathogenic Bacteria and Protozoa, McFarland, Vol. 8 page 625.

tioned if any of us have come very close to a correct interpretation of many of the results following the use of anti-hog cholera serum and virus. From its very nature there were two sides to the question, and two, or perhaps more correctly, three interested parties—the owner of the animals, the administrator (usually a veterinarian), and the serum producer. And it is a lamentable fact that when the results following the use of anti-hog cholera serum and virus were not satisfactory, these parties, more frequently than otherwise, came together antagonistically, the producer trying to place the blame upon the user and the user trying to place the blame on the producer, while the owner usually "held the bag."

As might be expected under such conditions, progress looking toward the clearing up of these grave questions, was materially hampered and, too often, entirely blocked. It would have been much better for all concerned if, instead of trying to incriminate each other, all had worked together in an earnest effort to determine and eliminate the cause of these troubles. Having been on all sides of the question, as a producer, as a user, and as an owner, and now neither, I have had experience which should place me in a position to judge fairly and impartially the merits of the controversy, and it is my opinion that all were guilty, or, to put it another way, all were partly correct and partly wrong, and none were right all the time.

As I see it, the producer has been guilty of putting out a product of which he knew little, occasionally of an inferior quality, and making unjust and exorbitant claims for his particular product; while the user has been guilty of administering a product of which he knew little excepting what the seller had told him, and too often he did not follow these instructions; in fact he was trying to practice a special branch of medicine upon which he had received little or no instruction in college, and to which, too frequently, he had given little or no special study.

Immunization is a truly special line of medication in contradistinction to curative medicine. It is lamentable, but a fact nevertheless, that the medical profession, both human and veterinary, is not, as a rule, very well posted upon the theories of immunity and the properties of immunizing agents, and as a rule the salesmen of these products know even less. Hence it is not surprising that there have been mistakes in this swine work, but rather that there have not been more, especially when we take into consideration the fact that the theories relative to swine diseases, put forth by most of our investigators, have been more or less incomplete, and in so far, faulty and misleading, and are probably responsible for a greater or less amount of our misunderstanding regarding these diseases, and especially for the fact that in the past we have been applying the term "hog cholera" to any one or more of a group of diseases that are characterized by quite similar symptoms and obscure pathological lesions, two or more being frequently associated in the same animal. And because of this group having been considered as one disease, little or no attempt was made at differential diagnosis, other than to consider whether the pneumonic or intestinal form prevailed, and so long as there was no reliable treatment, prophylactic or otherwise, correct diagnosis was not essential.

Progress Impeded By Many Obstacles

But, after the use of anti-hog cholera serum had become well established, when a disease broke out after a reliable serum had been properly administered, it set the progressive practitioner and producer to studying, with the result that today we are getting what we think are clearer glimpses of the facts. However, the progress has been impeded because of its having been very difficult for us to get away from the one disease idea, and especially because we had no very clear-cut theories to take its place. Another very serious obstacle to be overcome is careless diagnosis, or perhaps more correctly stated, incorrect diagnosis, and only partial descriptions of pathological lesions. It is a common occurrence for two men to describe the same autopsy so as to convey distinctly different ideas to others. Another very common error is the failure to differentiate distinct and separate pathological conditions.

These and many other conditions have materially retarded the clearing up of these vexatious questions, but perhaps one of the greatest of these has been the attempt of the interested parties to incriminate each other, when there was no fault or error except the lack of knowledge upon both sides to recognize the true conditions.

It is time to bury the hatchet, and also to get away from the one-disease-only idea, and to look at the situation squarely, with determination to get the facts in the case and thereby solve the problems.

With these objects in view let us briefly consider what appears to me, some of the more essential points.

Diagnosis Difficult

First, and most essential, is that of diagnosis, and as I see it this is no simple matter. Until quite recently it was generally agreed that petechiae of the kidney and inner wall of the bladder indicated a disease due to the filtrable virus, but now we know that they are simply evidences of a hemorrhagic toxemia, and may appear in any disease of this character, especially in hemorrhagic septicemia.

As a rule the filtrable virus produces petechial hemorrhages of the lymph-glands throughout the body, while in hemorrhagic septicemia they are rather confined to the periphery. Again, when the filtrable virus is present, the tendency is for the disease to spread rapidly throughout the herd, while with the other diseases of the group it spreads more slowly, but these are by no means constant. A proper reading of the temperature is of value for, as a rule, the filtrable virus produces a higher temperature than the other diseases of the group, but this is not constant, for in some instances the temperature will not be very high (104 to 105° F.) in the presence of the filtrable virus, and, on the other hand, as high as 107 to 108° F. when it is not present.

Again, one reading, or reading on one day only, is often misleading, because of the fact that frequently there are marked changes in the temperature of the sick animals from day to day. Upon the whole, the temperature of the apparently healthy animals is of as much, or more value than that of the sick, because in the presence of the filtrable virus there is usually a marked hyperpyrexia before the animals manifest any symptoms of illness.

It is easy to determine the presence or absence of extensive lung or intestinal lesions, but knowledge of their presence does not get us very far unless we are able to determine whether they are primary or secondary lesions. Or what about the case where the same animal presents all of these lesions, and the others which usually accompany them, or what is perhaps, more common, where in two animals of the same herd lung lesions predominate in one, intestinal lesions in the other? On the other hand, a more or less extensive, moist, pinkish or yellowish gray, or gray-colored solidification of the lung, with apparently little or no active inflammation, or a more or less extensive acute lobar inflammation that presents considerable increase of the interlobular tissue, with or without necrosis, indicates the presence of a pathogenic strain of B. suisepticus and is the swine plague of Salmon and Smith, or, as we now term it, hemorrhagic septicemia. Either of these conditions may be accompanied by a more or less extensive pericarditis or myocarditis, or both, and frequently the so-called "thumps" in pigs is due to irregular and labored heart action, rather than to respiratory troubles. This is especially true in cases of extensive myocarditis. The relation of thumps to the heart action may be easily ascertained by palpation.

Other Forms Due to Same Organism

There are a number of other forms of disease produced by the hemorrhagic septicemia group, that may make their appearance with or without filtrable virus being present, but the limits of this paper will not permit their discussion further than to suggest that probably most of the symptoms of nervous derangement frequently met with in so-called cholera outbreaks are due to a form of this micro-organism.

In intestinal affections, where there is a thickening with more or less erosion of the mucous membrane, especially of the large intestines, with more or less tendency to ulceration or sloughing, it is pretty safe to assume the presence of the typhus group, as B. suipestifer or B. paratyphosus A or B.

Another micro-organism frequently found in lung and intestinal lesions associated with the micro-organisms of these various groups, is the B. pyocyaneus. Grown in the laboratory this micro-organism produces a toxin, and it is reasonable to suspect that its presence in the animal system would result in more or less toxemia, but as yet, this has not been determined definitely.

But with these well defined pictures before us, what are we to do relative to the filtrable virus which may or may not be present? And what can we say about those innumerable cases where there are

no well marked lesions of these diseases, but more or less evidence of all?

I am free to admit that in many cases I am unable to arrive at a diagnosis that is at all satisfactory to myself, and so far I have not found a laboratory diagnosis of much assistance, because the presence of most of the various bacteria of either of these groups does not necessarily indicate that they are of a pathogenic strain. As I see it (which, by the way, is subject to change as new facts are brought forth), the only safe way is to assume the presence of the filtrable virus accompanied by such other invaders as the evidence warrants.

As to treatment, I would advise large doses of a reliable anti-hog cholera serum, and anti-serum for such of the invaders as the case warrants, but no bacterins. Why? Because all of these diseases are toxemias, and it is the toxins of the various organisms that kill the animals, and bacterins are only concentrated solutions of these toxins prepared artificially. Where the animal system is already full of these why should we inject more?

And right here let me emphasize the fact that we are getting under pretty good headway on the discovery of another error as great as the one we are just beginning to get free from. With all the present furore about hemorrhagic septicemia, necrotic enteritis or, as some think, necrobacillosis, secondary invaders, bacterins, etc., etc., there is grave danger of forgetting that there is a filtrable virus disease, and so far as our present knowledge goes, it is by far the most important of all, and as far as I am able to learn there is no practicable method at present whereby it can be positively included or excluded.

It appears to me that it would be advisable to go back to the Salmon and Smith nomenclature and use the term "swine plague" for the diseases caused by the hemorrhagic septicemia group of bacteria, and "hog cholera" for those conditions due to the typhus group, and use a new term for those conditions caused by the filtrable virus, and the honor of selecting this name should be given to the discoverer of this virus.

Much Study and Research Necessary

There are many other points that need much study and research work before we can clear up many of the questions involved in this subject, and especially from an immunity standpoint, and not the least of these is the relative effect of two diseases attacking the same animal at the same time. We do a considerable amount of guessing about this, and while it would be a comparatively simple laboratory procedure, there has never been any special work done on it so far as I am aware.

Col. Victor Vaughn, M. R. C., U. S. A.,[1] in discussing influenza of the human states, "If I were asked to define influenza I should say it is a disease of unknown origin, characterized by a marked leucopenia. * * * It takes away resistance, and the organisms that take advantage of this, are the prevailing organisms in that community," and it occurs to me that by changing a few words this affords the best definition I have seen for our so called hog cholera. Suppose he had said, "Hog cholera is a disease of unknown origin, characterized by a hemorrhagic toxemia. It lowers resistance and the prevailing organisms of the community take advantage of this, and appear as what we are now inclined to term secondary invaders." This appears to briefly, but completely, cover the ground.

This brings to the front another important point, and that is, the conditions now attributed to the secondary invaders differ in different localities. For instance, swine plague will be prevalent in one community and hog cholera will not be seen, while in another community the reverse will be the case, but owing to the fact that both the groups of micro-organisms that cause these troubles, are so generally distributed, their complications are more uniform than they would otherwise be.

Again, if our theories are correct, the more generally immunization is practiced the more resistant the animals should become to the disease, and as the work of immunization progresses, the disease due to the filtrable virus should be less prevalent, and it would appear that it is working out this way. On the other hand, little has as yet been done looking toward permanent immunization against the various other diseases, consequently they are appearing normally, therefore the past ratio of the prevalence of these various diseases is being disturbed so that we are seeing more of these other diseases in proportion to the disease due to the filtrable virus than

[1]Journal Am. M. Asso. 12-21-18. page 2099.

formerly; at least it would appear as though we are seeing more of these diseases uncomplicated by the filtrable virus, and this is likely to keep on unless steps are taken to build up a resistance against these various organisms. This might be accomplished by actively immunizing against them, as we are doing in the case of the filtrable virus.

This subject should be given the study and attention that its importance warrants, each case being treated according to the conditions which it presents, with a view to saving the animals and maintaining professional prestige. If the conditions indicate that large doses of anti-serum should be used, use it, or do not treat the animals. If the secondary invaders are presenting virulent conditions in your vicinity, use a bacterin as a prophylactic in connection with serum and virus in healthy droves. But some say, "My clients will not stand for this expense," which means that you let them dictate the treatment you should use. In other words, the owner is the veterinarian, while you are neither nurse nor interne.

I would prefer to maintain my professional standing, and where the owner insisted on doing the prescribing I would let the county agent, or some one else do the administering and assume the responsibility.

In concluding we might summarize as follows:

1. Our present knowledge of the diseases of swine is in a very chaotic condition.

2. We have been applying the term "hog cholera" to a group of closely associated diseases.

3. Each of these various diseases is due to specific micro-organisms, though frequently seen in combinations that produce quite similar symptoms and confusingly mixed pathological lesions. The most important of these is the filtrable virus.

4. Most of the members of the hemorrhagic septicemia and typhus groups that affect swine are usually not virulent, but under conditions not at present understood, they may become very virulent.

5. These diseases are most prevalent where the resistance of the animal has been lowered by unfavorable conditions, of which apparently the most common is an attack of the filtrable virus either artificially or naturally acquired.

6. There is urgent need of a better understanding of the relations of these various diseases.

7. In order that the best results may be obtained, it is essential that there should be close cooperation rather than antagonism among all parties concerned.

8. There is an urgent demand upon the members of the veterinary profession to better inform themselves on the theories of immunology and the properties of immunizing agents, so as to render service of a professional standard, and to protect themselves against ignorant and unscrupulous salesmen.

An Outbreak of Hemorrhagic Septicemia Among Sheep

By H. PRESTON HOSKINS, V. M. D.,
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HEMORRHAGIC septicemia in sheep has been reported, both in Europe and in the United States, on several occasions. Baker (1) states that the disease is rare in this country. The disease has made its appearance in a number of widely separated localities within recent years, especially in some of the states west of the Mississippi River. Ward and Beebe (2), of Minnesota, reported an outbreak of the disease among sheep in 1911. Glover, Newsom and Alkire (3) recently reported the existence of the disease in Colorado. Several veterinarians have reported the disease to be rather prevalent in the Northwest. The disease designated as "septicemia pluriformis ovium," by Miessner and Schern (4), is apparently the same pathological entity. M'Gowan and Rettie (5) have reported upon the disease in Scotland, and these authors are of the opinion that many of the cases of so-called "braxy" are probably hemorrhagic septicemia.

Recently Mori (6) published his observations on the disease in Italy.

Just as we have variations in the clinical manifestations of hemorrhagic septicemia in other species, more especially among cattle, the disease in sheep seems to be subject to the same influences, and in different outbreaks of the disease these variations occur, frequently confusing the clinician who has not had a great deal of experience with the disease. There are certain sections of the United States where the disease is apparently unknown in any form or in any species. There are also localities where cases of the disease have been met rather frequently among cattle, to the exclusion of other species. Of course it is quite possible that the disease has been overlooked or failed to be recognized in other species.

The Present Outbreak

In a paper to be published later, the author will discuss the relationship between hemorrhagic septicemia and the disease of young cattle known variously as "stock-yards' fever," "stock-yards' pneumonia," etc., which has been rather prevalent during recent years. The most constant feature of the disease is its predilection for young cattle of the stocker and feeder class, which have passed through certain of our large public stock-yards. In the outbreak to be described the sheep were not natives, but had recently been shipped into southern Michigan, via Chicago, the band having originated in Montana.

On October 10, 1916, a trainload of sheep arrived at Manchester, Mich. There were in the neighborhood of 9,000 sheep in the shipment, consisting of 29 double-decked carloads, about 300 sheep to the car. These sheep were distributed among some thirty different farmers, around Tecumseh and Adrian, for feeding purposes. They were driven from Manchester to their respective destinations on the first, second, third and fourth days following their arrival in Manchester. The purchasers of the sheep were of the opinion that the animals were in very good condition, considering their long journey, which had been made in quicker time than usual.

Sickness made its first appearance among the sheep just ten days after their arrival at destination. In a few instances the new sheep had mingled with native sheep, but inquiry failed to elicit information of the spread of the disease to the native sheep. Although practically every farmer who purchased some of the sheep reported losses, the percentage of the losses on different farms varied considerably. One man lost 45 out of 350, while his neighbor lost only four out of a carload. Another man lost 25 out of two carloads. At first it was believed that the sheep were dying from digestive disturbance following change of feed. This idea was abandoned when it was discovered that there was sickness in practically every flock, regardless of the kind of feed or method of feeding, which was quite variable among the thirty farmers. Some of these men were experienced sheep feeders, and had handled sheep successfully for many years. The suggestion that parasites were the cause of the trouble was soon dismissed, following observation of the clinical symptoms and a few postmortems.

The symptoms were rather uniform in most cases. Temperatures ranged up to 105° F. Many animals were completely off feed. Depression was very noticeable, many of the animals standing around with backs arched. Breathing was accelerated. Some of the sheep exhibited colicky pains and were very restless and uneasy at times. Coughing and sneezing occurred quite frequently. Some of the sheep ground their teeth persistently, and muscular tremors were much in evidence. There was cessation of rumination in most cases. One of the most marked and constant symptoms was the passage from the bowels of a thin, blood-stained discharge, having a very fetid odor in most cases. The animals were usually sick for a few days before death supervened, and several animals which exhibited only mild symptoms made a recovery.

Upon postmortem examination the lesion most frequently met with was a very severe hemorrhagic enteritis, most marked in the small intestine. Frequently the cecum was extensively involved. Petechial hemorrhages were noted on the heart muscle, and areas of lobular pneumonia were noted quite regularly in the lungs. A marked distention of the gall-bladder was noted in one case autopsied. Intestinal parasites were found in some cases, but in others none were found.

Samples of fresh tissues and heart blood were brought to the laboratory, in two sets, three days apart. The first lot consisted of the hearts of two sheep, wrapped in gauze wet with an antiseptic, which were brought to the laboratory by the first veterinarian called to see the sheep. The bacteriological examination of these tissues was negative, no growth being obtained in plain bouillon, plain agar and blood agar. Direct examination of smear preparations failed to reveal any suspicious organisms. In spite of the negative outcome of the bacteriological examination, a tentative diagnosis of hemorrhagic septicemia was made, based on the history of the outbreak and the symptoms shown by the sheep, and the author proceeded to the scene of the outbreak for the purpose of making further observations and securing additional material for laboratory examination.

The second lot of specimens consisted of heart blood from two animals, one that had died just previous to autopsy, and the other killed in a moribund condition. One heart with the vessels ligated was also brought to the laboratory. From the coronary vein of the heart a small amount of blood was secured and used to inoculate culture media. The two samples of heart blood were also used to inoculate various media. It is quite interesting to note that the media inoculated with the blood secured from the heart chambers remained sterile, while the cultures made from the coronary vein yielded an organism which was later positively identified as bacillus ovisepticus. The isolation and identification of the hemorrhagic septicemia group of organisms will be discussed in a future paper on this subject.

Treatment

Very little treatment was applied in this outbreak. The disease seemed to be at its height when the author made his first visit, and some of the sheep were believed by the owners to be recovering. Very few new cases developed during the seventy-two hours consumed in getting the materials to the laboratory, isolating and identifying the organism. As soon as an animal was noticed to be sick, it was isolated. Kreso was added to all drinking water, and everything done to improve the hygienic conditions.

Discussion

Attention has already been called to the similarity of the present outbreak of ovine hemorrhagic septicemia and so-called "stockyards' pneumonia" of young cattle, from the epidemilogical standpoint. Investigations of the latter disease have already very strongly suggested the etiological relationship of bacillus bovisepticus to the cattle disease. In the present outbreak we have a history, certain clinical manifestations, postmortem pictures and laboratory findings which fit in very nicely as links in the chain of evidence to prove that the cattle and sheep diseases are similar in nature, and that the hemorrhagic septicemia organism plays some important role in the etiology of the disease.

Sporadic outbreaks of ovine hemorrhagic septicemia are met with, just as such outbreaks sometimes occur among cattle, without the history of recently having passed through a public stockyards. Usually such cases are acute, deaths occur very suddenly, often without warning, and it is no unusual experience to have such outbreaks cease just as suddenly as they started. Atypical cases present difficulties in the way of making a prompt and accurate diagnosis clinically. The characteristic petechial hemorrhages which for so long have been associated with the disease can hardly be said to be absolutely specific for hemorrhagic septicemia. These lesions are frequently seen in other pathological conditions. Failure to isolate the hemorrhagic septicemia organism from a given case or cases of the disease is not evidence per se of the non-existence of the infection. On the other hand, there is even some doubt as to whether we are perfectly safe in making a diagnosis of hemorrhagic septicemia simply by demonstrating the presence of bipolar organisms in the blood or tissues of a dead animal.

Summary

Hemorrhagic septicemia is a serious disease of sheep. It has been encountered in widely separated localities, both in Europe and the United States. Either the disease is on the increase, or we have had it with us for some time and its exact nature not previously determined.

In the outbreak of the disease here re-

ported, wherein the disease made its appearance among a band of nine thousand sheep, shipped from Montana to Michigan, via Chicago, and distributed to some thirty farms on arrival, every one of the thirty flocks suffered losses, although the mortality varied widely, on the different farms.

The similarity is pointed out, existing between this disease and that reported form of hemorrhagic septicemia in cattle more generally known as "stockyards' pneumonia."

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What is Meant by "Horse Sense"?

By LIEUT. G. H. CONN, Camp Taylor

THE term "Horse Sense" is a very common expression among present-day writers and we find it in all classes of literature, newspapers, periodicals of all kinds, magazines and books. While this expression is quite often used by some of our very good writers and statesmen, after giving much study to it, we are more than ever convinced that the term is altogether misused and does not convey the meaning that is intended.

According to Webster, sense is "The faculty by which objects are perceived physically or mentally; discernment; understanding; conviction; good mental capacity; correct judgment; opinion; meaning; signification; moral perception. Thus the term "horse sense" is, in its fullest meaning, intended to convey the impression that the horse has the intellectual ability to meet all those conditions that might be imposed on the mind from the above definition. We are going to offer the proofs of scientists and of a long and varied experience with the horse family to disprove the significance that is commonly attached to the term mentioned above.

By the inexperienced and impractical, many people are led to attribute to the horse, intelligence and mental powers which, if he possessed, would render him useless for the purposes of man. It is owing to the lack of these powers that we are able to hoodwink the horse into performing tasks for us day after day. He does not possess enough mental power to enable him to realize that he is so much stronger than man that he could successfully resist man's feeble efforts to compel him to render service for him. Nature created the horse with this lack of mental power, and so we are able, through constant rehearsal, to compel the horse to yield obedience to our wishes and demands.

It is in the cerebrum or large portion of the brain, composed of gray and white matter, the gray being placed externally and thrown into convolutions, that intelligence is located. These convolutions, though well marked in the horse, are by no means regular in their position or direction, thereby forming a great contrast to the brain of man. The purpose of the convolutions is no doubt to increase the surface of the brain, and the deeper and more complex they are, the greater, as a rule, is the intelligence of the animal. These convolutions in the horse are comparatively shallow.

No Sense of Right or Wrong

Has the horse a moral sense of right or wrong? We, from our experience must say, "no." We have no evidence that he knows he is doing anything wrong when he kicks his barn down once or twice each week, or that he is doing wrong when he becomes scared and runs away. He does understand, however, that he must not refuse a jump and he also learns to know what will happen to him if he stumbles when he is trotting or walking.

If the horse ever had any appreciable strength of will, he has lost it through domestication. The so-called stupidity of

Cavalry horse, accidentally discovered to possess histrionic ability and training, posing for the camera.

the ass and the provoking obstinancy of the mule are not indications of lack of intelligence, but show a determination of purpose and a strength of will which, if they understood how to combine against man, would obtain for them complete freedom from coercion. Man has the power of reasoning and so can out-general them and make use of mechanical appliances to control them with and thus they are hoodwinked into rendering service for man. It is a well known fact that when mules get into a difficult position they rarely injure themselves to any extent, while horses in the same circumstances will often fatally injure themselves. In our shoeing shops in the army shoeing schools, we are often compelled to put animals in the shoeing stocks. Most horses come from the stocks sore and stiff and sometimes so badly used up that it is weeks before they entirely recover. We have never yet seen a mule come from the stocks injured in any way. A horse when he runs away becomes so panic-stricken that he will run into other objects that get in his way and thus injure himself severely. A mule will not do this. Occasionally one finds a horse that shows some appreciable strength of will in refusing to pull on a load that he finds too heavy for him. This is known as "jobbing" or "balking." In our army remounts where we keep several hundred animals together in the corrals, it is invariably the horses that stampede during a severe storm or from a scare of some kind, the mules rarely do so.

The horse is a peculiar mixture of courage and cowardice. No animal can endure physical suffering better than he. Nothing is too big or too wide for him in the hunting field when his blood is up. He keenly enjoys both the chase and the race, in spite of the punishment they may entail, but he is frightened out of his life by a piece of paper blowing across the road, or his own shadow.

Reasoning Power Small

Reasoning power in the majority of horses is very small. He runs away because he is seized with panic or because his spirits are bubbling over. We daily see evidences of this lack of reasoning in our large veterinary infirmaries—horses seriously and often fatally injured from some trifling cause, such as getting a leg over a tie rope or getting fast in the stall or in a fence. If the horse had seasoning power he would remain quiet until released, but instead he acts like a lunatic, inflicting wounds and injuries upon himself that may lay him up for weeks and months. The lack of reasoning is well shown by the horse that switches his tail over the lines; instead of lifting his tail from the rein, in response to the driver, he grips it all the more tightly and many times becomes uncontrollable.

The horse is very conservative. He likes nothing new nor any departure from his

ordinary mode of life. He will starve himself for days rather than take a new feed, and he dislikes a change of stable or a new place.

His gregarious instincts are proverbial. He frets at the absence of his companions, and if accustomed to work among a body of horses, as in cavalry, he will take any degree of punishment rather than leave them for five minutes. During absence from his companions he neighs, sweats, paws with the forelegs, and almost screams with delight on rejoining them, not because he loves them, but because he dislikes being alone.

Finally, his predominant feature and the feature of all animals below adult man, is the childishness present throughout life. Probably the absence of care, worry and anxiety may account for this. He will play for hours with a piece of rope, or nibble his neighbor persistently; even the oldest horses when "fresh" will perform the antics of a foal, and the imitative instinct is so great that if one of a string of horses being led should happen to kick out, the action is repeated all along the line, as if by preconceived arrangement.

Sydney Smith defined the difference between reason and instinct as follows: "If in order to do a certain thing, certain means are adopted to effect it, with a clear and precise notion that these means are subservient to that end, the act is one of reason; if, on the other hand, means are adopted subservient to an end, without there being the least degree of consciousness that these means are subservient to the end, then the act is one of instinct."

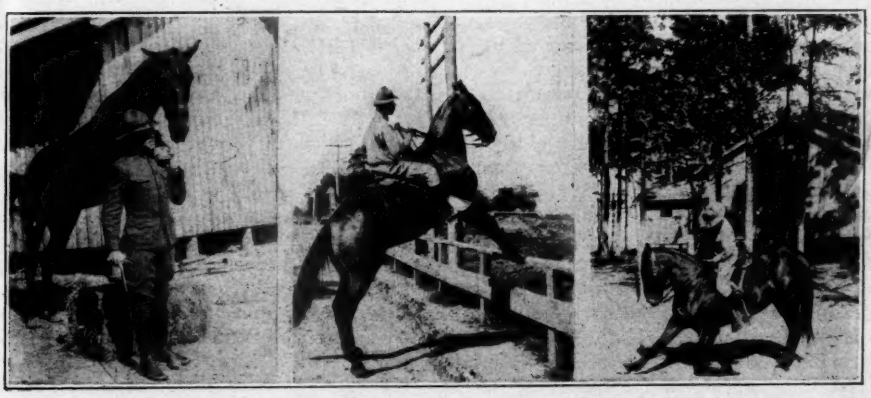
Morgan believes that between instinct on the one hand and reason on the other, we may insert as a middle term "intelligence," while Romanes and others use the word "intelligence" as synonymous with "reason."

Morgan defines instinct as a motor response to a certain stimulus, viz., a reflex act, but one accompanied by consciousness. Animals come into the world endowed with this innate capacity for motor response, but these instincts are not quite perfect; they need training and experience, and their instructor is "intelligence." Intelligence, according to this observer, does not imply a conscious knowledge of the relation between the means employed and the end attained; such a conscious knowledge would be reason.

We are asked, in other words, to regard animals as simply reflex machines, their brain being very little higher in the scale than their spinal cord, and this may be true of some animals, but certainly not all.

Morgan's definition of instinct and intelligence, offers no reasonable explanation why dogs fight, and why they worry cats; why a horse so inclined, will turn his quarters toward another as he passes and rapidly let both hind legs fly in the direction of his objective, nor will it explain why a horse will use his fore legs to strike when he knows his hind legs cannot reach the object of his irritation. It is absolutely impossible to believe that such acts imply no conscious knowledge of the relation between the means employed and the end attained.

The higher animals are capable of a limited amount of reasoning; with some it



Duke, cavalry horse, performing stunts under direction of Lieutenant Conn at army remount.

is fairly developed, with others it is extremely imperfect. The elephant and dog occupy the top of the scale, the ox and sheep the bottom, and the horse comes midway.

We seem unable to separate reason from intelligence, but there is no difficulty in separating them from instinct.

Reflex Action Highly Developed

Animals are born with such complicated reflex acts as walking, galloping, jumping, etc., so highly developed that they are employed at once. No member of the human family has been seen to walk and run about a few hours after leaving the womb, for both brain and spinal cord are incompletely developed and the acts have to be learned, while animals (excepting the dog and cat), such as foals, calves, lambs, goats, etc., are born prepared to at once get on their feet. They require no teaching and no imitation; their senses are perfect; they can recognize their mother or a stranger; can smell, see, hear, in fact, they have nothing to learn, for they are born with as much intelligence as their parents, and only differ from them in one respect, i. e., they are born wild, and so have to learn confidence. Domestication and obedience are not properties transmitted from parent to offspring.

Just let a horse find out that he can shirk his task, by stopping, turning one way or another contrary to the driver's wishes, turning to go toward home, or refusing to go at all, and be assured, after that, he will try to do the same thing again. But if you can make him understand that rebellion is useless, he will perform his work with apparent good will.

The horse is a fool and a bully, as one can readily see when attempting to remove one from a burning barn. He will invariably break away and return to his stall. The horse has no reasoning powers, hence he cannot see why his old accustomed stall, which has protected him so long, will not protect him now. But oftimes, if blindfolded, he can be led from the building. He is also a fool, because at times he allows his cowardice to compel him to run away endangering his own life and the lives of those about him. A horse that has been frightened at some particular thing, will usually be doubly horrified upon seeing the same thing again, sometimes almost to the point of insanity.

The horse loves his home and if it has been a pleasant one, he will probably never forget it. At the close of a hard day's work when his head is turned toward it, he will prick up his ears and show in different ways that he is glad to get home. Some horses, when sold or taken away to unaccustomed surroundings, will refuse to eat or drink for a few days, and at times this homesickness becomes so great that the animal wil get very poor and weak before he becomes reconciled to his new environment.

Affectionate to His Kind

It cannot be truly said that the horse has any affection for man; but, on the contrary, he is very affectionate to those of his own kind or to other animals. Some of our greatest horses have made companions of animals of some kind. Cresceus, the great trotting stallion, was always accompanied by a dog and was always in his company when not at his work. Many horses show hatred toward jockeys who have punished them, usually recognizing them by their voice, many times flying into a fearful rage when they hear their voice, and often will not permit them to enter their stalls. Ofttimes these same jockeys have ridden these horses and without their discovering it unless the jockey spoke to them.

If the horse possesses but little affection, it is compensated for by his cherishing no resentment. He will kick his friend as readily as a foe, or in many cases, his groom, with as much cheerfulness as a perfect stranger. To all his hard life and the abominable cruelties of civilization, he shows no sign of resentment. Water and feed him and give him a place to lie in and he forgets the past.

Memory is one phase of intelligence that the horse has in a very highly developed state. It is his wonderful memory that makes him such a valuable servant of man. If it were not for this wonderful memory the horse would be of little use to man, as he could not be used with any degree of dependence or safety. It is due to his wonderful memory that he is, by constant repetition and rehearsal, subjected to the wishes of man. With this in mind, men who train colts and horses are always careful lest their charges develop faults during their early training. This trait is especially well evidenced by horses that have

been frightened or injured by various objects or at a certain place, by the fear and well-known attitudes that they assume under the same circumstances ever after. Some horses that have been badly frightened by some certain object never forget it. It is doubtful if a horse ever entirely forgets especially if it has been a pleasant one. An old race horse, for instance, after being retired from the track for several years, when driven onto the track will show all evidence of understanding just what is expected of a horse on the race track. As proof of a horse's wonderful memory, I have but to recite an experience that I had with an old bay cavalry horse I called Duke. Duke had been at the remount where I was located for at least a year and had never been used. He developed a lameness and was sent to my hospital. While there, I discovered that he knew some tricks. (I know positively that he had not performed these tricks for at least a year.) I began working with him and learned that he was thoroughly high-schooled. I saddled him and in a few minutes he was cake-walking, dressing up, kneeling and taking the other poses shown in the pictures. This, to me, is conclusive proof of a horse's retentive memory.

It can readily be concluded from the foregoing that the term "horse sense" as ordinarily used does not have the meaning that is credited to it. Strictly speaking it is a misnomer and the expression that should be used is "common sense."

Effect of "Ground Glass" on the Gastro-Intestinal Tract of Dogs*

By MAJOR JAMES S. SIMMONS, M. D., U. S. A., Philadelphia
And FIRST LIEUT. WILLIAM C. VON GLAHM, M. D., U. S. A., Baltimore

DURING the past few months quite a number of food specimens have been received at the Southern Department Laboratory, Fort Sam Houston, Texas, with requests for examination to determine the presence of "ground glass."

Of 120 specimens of different kinds, glass was found in the following samples: cakes, 2; cottonseed hulls, 5; jelly, 1; milk, 1; prepared mustard, 1; peanut butter, 1; sliced beef, 1, and sugar, 1.

The glass found in many of these specimens was small in size and amount, and could have been accidental. Some few samples of food in closed non-sealed containers, however, showed many large pieces of broken glass, which, apparently, had been placed there purposely by those sending in the specimens.

Many reports of so-called "glass poisoning" were made by newspapers and individuals, and the subject was discussed in a number of medical journals throughout the country, but we have not been able to obtain positive data concerning a single authentic case of illness due to the ingestion of glass in any form or size. A partial review of the literature gave no definite information.

*Journal of the American Medical Assn., Dec. 28, 1919.

Feeding Experiments

In an attempt to determine what lesions, if any, are produced by glass in the gastro-intestinal tract, feeding experiments were carried out on dogs.

Dogs.—Ten young dogs obtained from the city pound of San Antonio, Texas, were placed in separate cages, numbered, and fed on scraps from the hospital mess. Records were made of the general appearance, weight, temperature (by rectum), blood count and feces examination (both gross and microscopic) for blood, pus, epithelium, etc. All these records, with the exception of blood counts, were made daily, until the completion of the experiments, when the animals were chloroformed and examined postmortem.

Glass.—Broken Petri dishes and test tubes were ground in a large stone mortar, after which the glass was divided into five sizes by passing through sieves of different mesh. The different grades of glass used ranged from Grade 1, which was designated "large broken," to Grade 5, called "fine powdered." A large amount of each grade was prepared and bottled.

Dosage.—The ten animals were divided into two series of five each. Dogs of Series 1 received 1 gm. of the grade of

glass corresponding to the cage number, while Series 2 (Dogs 6 to 10) received 5 gm. doses in the same order. Thus, Dogs 1 to 6 received Grade 1 glass, but Dog 6 received 5 gm., while Dog 1 was only given 1 gm. doses.

Each dose of glass was mixed in a mortar with about 200 gm. of lean meat and immediately fed to the dog. All grades, except Grade 5, were easily detected in the food with the naked eye. The first two doses were given at four-day intervals, but after that they were repeated daily until the animals were chloroformed. (The second dose in each case, owing to a mistake, was of different grade glass.)

Weights.—The original weight was accepted in each case as normal, and the fluctuations that were recorded represent merely loss or gain in pounds.

The weight curve in each case showed fluctuations, and in five of the dogs there was a slight loss of weight as shown on the day of necropsy, averaging about one-half pound. Two of the dogs showed marked gain in weight, and in three the initial and final weights were identical.

Temperature.—These records by rectum showed nothing remarkable except in Dog 5, which had a temperature of 104 F. on two occasions: May 21, twenty-four hours after receiving the first dose of glass, and May 24, when the second dose of glass was given. The rise in temperature was probably due to some other cause, as it was only temporary and as Dog 10, which received five times as much of the same grade of glass, was not similarly affected.

FLUCTUATION IN WEIGHT

Number of Animal	Weight Gained	Weight Lost
1	———	½ pound
2	———	½ pound
3	None	None
4	3 pounds	
5	None	None
6	———	½ pound
7	———	1 pound
8	———	½ pound
9	1 pound	
10	None	None

Number of animals that gained weight	2
Number of animals that lost weight	5
	Pounds
Average weight gained	6
Average weight lost	6

Feces.—All daily examinations were negative for blood and pus. Dog 5 showed a slight temporary diarrhea with some mucus at the time of the rise in temperature, after which the stools were negative. Practically all the dogs were infected with *Uncinaria* and *Taenia*.

Necropsy Findings.—The dogs were killed with chloroform and immediately examined. The postmortem findings were remarkably uniform in the absence of any visible lesions. As the findings were so similar, detailed account of each will be omitted and one protocol given:

The peritoneal surfaces are smooth and glistening and there is not any excess of fluid in the peritoneal cavity. The omentum contains much fat. The intestines are not distended. The lymphatics are engorged and beautifully marked out so that they are easily traced from the intestine through the mesentery to the glands. The stomach contains a large amount of undigested food in which particles of glass are readily discernible. The gastric mucosa is gray and translucent. There is no ulceration nor any evidence of hemorrhage. The intestine contains a moderate amount of digested food in the upper half. The intestinal mucosa is gray and translucent, and there is no ulceration, hemorrhage or exudate present. There are several taeniae and many uncinariae present in the lower portion of the bowel. The lungs, heart, spleen, pancreas and liver are negative.

The postmortem findings in the control dogs were identical, except for the absence of glass.

For the microscopic preparations from six to twelve segments of the intestine from different portions were removed before the bowel was opened. This was done to avoid the possibility of any trauma to the mucosa while opening the bowel. These segments measured from 5 to 10 mm. in length. The stomachs were opened before the specimens for microscopic examination were removed. The tissue for examination was immediately placed in 10 per cent solution of formaldehyd. The paraffin method was used in the preparation of the material for sectioning.

The findings microscopically were equally negative. The sections from the stomach of each of the dogs and from the control dogs did not show any abnormal changes. The epithelium was intact and there was not seen any infiltration with leukocytes or small round cells of the mucosa, submucosa of muscular layers in some of the sections. From the intestines of four of the dogs (3, 4, 6 and 7) there was seen some denudation of the tips of some of the villi of their epithelium. There

was not, however, any exudate on the surface of the villi, or any inflammatory reaction within them. No other abnormal changes could be found in any of the sections. The central lacteals and lymphatics were engorged in those dogs that were examined during the period of active digestion. The gross and microscopic findings were identical on the dog that was given one large dose of glass (50 gm.) and examined postmortem forty-eight hours later.

In both of the control dogs, denudation of the tips of some of the villi of their epithelial cells was observed.

Conclusion

The ingestion of ground or powdered glass has no toxic effect and produces no lesion, either gross or microscopic, on the gastro-intestinal tract of dogs.

The Army Fly Campaign*

By F. M. MAXFIELD, D. V. M., Tama, Iowa

THIS campaign is a part of camp sanitation. The object of sanitation in the army is to keep the maximum number of men in service, which means in line of duty. The history of wars during the past fifty years shows that armies have suffered twelve deaths from disease to one death from shot and shell. The Russo-Japanese War is the first in which death from disease did not exceed that from shot and shell.

The most common diseases of the soldier that are factors to be contended with may be divided into two classes: intestinal and respiratory. The medical profession has accomplished its best work in combating the intestinal diseases.

Let us consider the past and present, confining ourselves to a particular community. Chickamaugua Park, Georgia, is a park nine miles out of Chattanooga, Tenn., containing 10,000 acres owned by the government. In this park are situated Fort Oglethorpe, Camp Greenleaf, Camp Forrest, Camp Lytle, and the government intern prison camp. In this park during the Civil War thousands died of typhoid, paratyphoid, cholera, amebic dysentery and malaria. Hundreds of men mobilized there, for training during the Spanish-American War died from these diseases.

During the present war this park has been used both as a training and mobilization camp. Among the thousands of soldiers that have passed through this camp only three cases of typhoid have developed. These three cases were infected prior to their entrance into the camp. One died.

*Presented at the 31st Annual Meeting of the Iowa Veterinary Association, January, 1919, Ames, Iowa.

Some may present the claim that this progress is due to the prophylactic treatment the medical department is using. However, this treatment does not prevent the occasional appearance of these diseases, nor have any tendency to check the outbreak from resulting in a camp-wide contamination. The susceptibility of individuals varies when they are gathered in large numbers for a varied length of time, and especially if contamination is widespread over the camp. Therefore, when we speak of the fly campaign let us remember that it is primarily a campaign launched against the gastro-intestinal diseases of the soldier.

The flies visit the sick rooms and while there pass from patient to patient and probably next visit the dining, pastry, or supply rooms; sometimes all of these rooms. They visit the latrines, the garbage cans, then the mess halls, kitchens and barracks. The fly's walking path is a source of contamination; his specks may be contaminated, and so may his vomitus. They breed rapidly, usually in horse manure and human excreta. So even the new hatch may be at once a carrier.

This leads to the factors in the fly campaign, i. e., the destruction of the fly by attacking each of its four stages throughout the entire season; keeping the fly from being infected by protection and destruction of all excreta and all decayed organic matter of vegetable origin; the protection of the water and food supply from possible contamination; the cooking of all foods when possible.

We now have a most interesting phase of the campaign which is the consideration of the four different stages of the fly.

The Fly—Musca Domestica

	Duration In Days
Ovum or egg	½ to 1
Larva or maggot	4 to 8
Pupa or chrysalis	3 to 5
Total	7 to 14 days

The ovum must be kept warm if it is to develop, and it is therefore usually laid in vegetable or fecal matter which is about to ferment, the chemical change supplying the needed heat.

The larva has no digestive glands and is therefore dependent upon predigested or other readily assimilable food, another reason for the fly ovipositing in feces. Its most interesting habit is that of burrowing. It does so first to reach moisture areas of its habitat. If disturbed it hides with great speed. Finally in the prepupal stage it comes to rest, an inch or two beneath the surface of the ground in the vicinity of its feeding place. Having reached this haven its skin contracts, hardens, and darkens, thus forming the pupa case within which the change to the perfect insect takes place.

The pupa remains without food for four days while developing into the imago. To enable it to escape from the pupa case and force its way to the surface of the ground the young adult is provided with temporary structures in the shape of a dilatable frontal sac, the first use of which is to pry open the anterior end of the pupa case. The young adult then emerges, and will escape through a depth of six inches of loose soil and even through six feet of dry sand, the latter being a truly heroic effort.

The adult provides the following points of anatomical interest. It is provided with a non-piercing, retractile proboscis through which food is sucked by the powerful pharyngeal muscles. The salivary glands are large and saliva is freely expectorated upon dry foods, which are thus dissolved prior to ingestion. The alimentary tract is provided with no other digestive glands. In addition to the stomach the insect has a large crop capable of holding a four day's food reserve. The hairiness of the body and legs is remarkable. The feet are provided with minute hairs, bristles, terminal claws, and adhesive pads. The latter consist of surfaces covered by multitudes of fine hairs and moistened by a glairy, sticky substance, by means of which the fly maintains its foot hold when inverted. For the conveyance of organisms in vast numbers it would be difficult to imagine a more suitable apparatus than the fly's foot.

Feeding Habits.

Having had no food for four days, the emerging imago is so hungry that it seeks the nearest feeding ground and engorges up to 70 per cent of its weight at a single meal. Its preference for certain foods is indicated by anatomical considerations. It must get either soluble carbohydrates or predigested proteins, the former from kitchens and swill tubs, the latter preferably from feces. When both sources are available the latrines and kitchens are frequented alternately. When resting, the fly may often be observed to regurgitate its crop contents until there is suspended from the end of its proboscis a drop nearly as large as its head. This fluid is drawn in and out with gusto so long as the fly is undisturbed but is dropped if alarm leads to hasty flight. A cropful of fecal fluid may thus be deposited on the surface of food ready for human consumption. Well fed house-flies defecate about once every five minutes.

Reproduction

The fecundity of the fly is truly phenomenal since the female lays from 120 to 150 ova at one time and may deposit five or six such batches in the course of her life. The number of individuals of each sex is about equal. The sexual maturity is attained a fortnight after emergence from the pupa. On the basis of the data already given, taking the minimal period for development and assuming that each female hatched lays a single batch of eggs, it is interesting to note that in a short space of seven weeks a single female may be the ancestress of from 432,000 to 843,750 flies. If, further, we take the number of generations in a normal season in temperate climates to be nine, a single fly might conceivably produce a number represented by five followed by twenty-nine ciphers. Although fly mortality must reduce this high number to figures more easily grasped, this datum is worth quoting, as an incentive to all fly control measures and especially to those which are instituted before the onset of spring.

(*Continued on page* 238)

AMERICAN JOURNAL of VETERINARY MEDICINE

Published Monthly by
AMERICAN VETERINARY PUBLISHING CO.,
9 So. Clinton St., Chicago

GUARANTEED PAID CIRCULATION OVER 8,500 MONTHLY

Address all communications to the AMERICAN JOURNAL OF VETERINARY MEDICINE, 9 South Clinton Street, Chicago, U. S. A.

Subscriptions from the United Kingdom should be sent to Messrs. Bailliere Tindal & Cox, No. 8 Henrietta Street, Covent Garden, London, England.

Criticism Based on Misinformation

THERE seems to be an irresistible tendency among many veterinarians, (perhaps all of us are addicted to the fault), to judge matters exclusively from their own viewpoint, regardless of how meager or incomplete their information on the matter may be. The discussions at almost any veterinary meeting afford ample illustration of the truth of this. Who has not heard the whole county agent plan condemned, from experience with a single individual in a single locality? Or a system for making inspections for interstate shipment decried because a single inspector has proved untrustworthy? Or a biological or other therapeutic agent branded as "no good," because of unsatisfactory results in the hands of a single practitioner or even from a single failure?

In the matter of public officials and their official acts, this penchant for criticism is fairly rampant among us, and in this, veterinarians do not differ from other Americans. The tendency is all too common to infer a public official's intention is to do thus and so and immediately proceed to find fault with him as though such were actually his intention; or again, to censure public officials charged with carrying out certain policies as if they were responsible for the real, or fancied shortcomings of those policies, when such officials have nothing to do with the formation or shaping of the policies themselves.

Elsewhere in this issue there is a most informative article by Dr. John R. Mohler that should silence not a little criticism of various matters; criticism that perhaps in every case has been the result of a failure to take into consideration all of the known facts about the matters under consideration. Veterinarians genuinely striving for the advancement of the profession and desirous of possessing all the accurate information available concerning the important problems confronting the profession at the present time will appreciate the frank statements of Dr. Mohler very highly. There is no veterinarian in the country but takes a pride in the veterinary section of the Bureau of Animal Industry and its notable achievements. A better understanding of its policies, plans, aims and purposes by practitioners cannot but result in an ever higher regard for it.

VETERINARY LEGISLATION IN INDIANA

Recent legislation in Indiana affecting veterinary activities includes:

An amendment to the act of 1913 in regard to the spread of hog cholera and other diseases of domestic animals, providing that rendering plants shall be "properly equipped with steeel tanks, enclosed dryers and condensers." Also permitting the owner of an animal at the time of its death to skin it, and extending the time allowed for the disposal of carcasses from twenty-four hours to "a reasonable time."

Another act creates a live stock sanitary board, composed of two live stock raisers and two veterinarians. The board selects a state veterinarian who is executive officer of the board and fixes his pay and

that of his assistants. The veterinary members of the board must have had at least three years' experience in veterinary practice and the state veterinarian five years' experience in practice. The old veterinary examining board is abolished. The two veterinary members of the live stock sanitary board are to constitute a veterinary examining board.

THE BATTLE OF THE MANGE

(Dedicated to the Ninth Veterinary Hospital A. E. F.)

You've read of Chateau-Thierry,
And the Battle of the Marne.
You have heard about Javigny,
And that mix-up at Verdun.
But there's one you never heard of
I'll gamble all my change—
It was a fierce old struggle,
The Battle of the Mange.

It wasn't fought with rifles,
Nor by Doughboys or Marines.
Artillery played no part at all,
In this act behind the scenes.
No hand grenades or bayonets
Were used upon this range.
Just the same—'twas a terrible battle,
This Battle of the Mange.

The Mange mite was the enemy,
Fighting Vets met the foe.
The horse's hide was "No Man's Land,"
The place where we staged the show.
We had no dugouts or trenches,
No gas or aeroplanes—
But still we fought some battle,
The Battle of the Mange.

From the front they came by thousands,
These horses that hauled the guns.
Beset by a pest who gave no rest,
The worst under seven suns,
And then the battle started,
It mattered not sun or rain,
Day and night we fought the battle,
The Battle of the Mange.

Out came the lime and sulphur,
(Ammunition if you please.)
Machine guns in the form of spray tanks,
That we pack on our backs with ease.
The dipping vats, our front line trench,
Were filled with a solution strange,
All was set and 'twas an even bet
We'd win the Battle of the Mange.

Day after day we struggled,
Battling the enemy strong.
The praises of these fighting Vets,
Should be told in story and song.
The Mite is slowly weakening,
And soon we'll have him chained,
But it sure has been a battle,
The Battle of the Mange.

The Artillery men and Doughboys,
Have finished up their work.
But we Vets are still in the trenches—
We have no time to shirk.
The boys are going home once more,
But our fight is still unchanged.
Still we fight that pesky Mite—
In the Battle of the Mange.

SGT. M. R. MORRIS, 9TH V. H.

Army Veterinary Corps Miscellany

FOLLOWING the glanders conference of the Veterinary Corps of the A. E. F., at St. Nazaire, France, 1st Lt. A. A. Leibold, of Chicago, was assigned to Base Laboratory No. 1, which is located at St. Nazaire, to carry on research work on the subject planned at the conference. That work is now completed and Dr. Leibold is expecting early orders to return to the United States for discharge. The investigational work consisted in carrying out the various laboratory tests for glanders. Serological tests were carried out on over 100 animals and bacteriological tests on twelve horses (which were destroyed) and on fifty guinea pigs.

Thousands of United States troups embark daily from St. Nazaire for the return trip to the U. S. A. and their discharge, and it is a lonesome task for the veterinarians stationed there, of whom there are several, to watch the returning thousands and know that their own time for departure is as yet not decided upon.

Major George B. McKillip of Chicago, Major D. H. Udall of Ithaca, and Capt. Beverly have been sent to Beaune (Côte d' Or) near Dijon, where the A. E. F. University is located. Major McKillip is dean of the veterinary department of the university, where arrangements have been made to enroll and give instruction to 40,000 students. Courses for the whole

university which include almost every conceivable branch of education or training on which instruction is given in any school anywhere, were planned, arranged and put into operation within a period of ten days. Major McKillip had considerably less than ten days in which to start the veterinary school.

Veterinary officers overseas seem unanimously in favor of the League of Nations and cannot speak too caustically of the "howling politicians" at Washington who affect to fear the proposed covenant.

Major Saunders Slated for Early Discharge

Major Chas. G. Saunders of the (British) Royal Army Veterinary Corps has been sent from Cologne, Germany, to Huy, Belgium, for demobilization which he expects soon. Major Saunders is well known to our readers as former editor of the Canine Department of the Journal, author of Saunders' Canine Medicine and Surgery and Senior Professor at the Ontario Veterinary College.

Frequent mention has been made of Major Saunders in these pages during the past four and one-half years. To recapitulate briefly, he joined the Canadian Army Veterinary Corps at the first call in August, 1914. He proceeded with the 3rd Brigade Canadian Field Artillery to England in the fall of 1914, losing only six of 800 horses taken with them on the trip. During the winter of 1914-15, the Brigade experienced all the horrors of a winter camp on Salisbury Plain, living continuously in rain and mud from October till February, when they left England for St. Nazaire, France. This trip was as eventful as the trip from Canada had been common place. It took four days; the weather was terrific, seven horses and three men were lost, washed overboard or died of injuries. The Brigade that Major Saunders was with, first went into action at Neuve Chapelle, but met its first real experience in war at Ypres, of accursed memory, on April 21st, 1915. The first night of the battle Major Saunders' Brigade lost 205 animals killed by shell fire and 187 badly wounded, and during the remainder of the engagement the loss averaged sixteen horses per day for each battery. Some description of this engagement was given in our September, 1915, issue, page 643, where it was told that Major Saunders did not remove his clothes or boots from April 22nd till May 10th. During the first night of the battle he had his horse killed under him and near the close of the battle, during the first poison gas attack of the war, he was gassed and collapsed about the end of May. He was next assigned to take charge of the Canadian Veterinary Hospital at Havre, a hospital in the embryonic stage at that time and having only 250 animals under treatment. As a result of immense exertion on the part of all concerned, this hospital overcame

GLANDER REACTORS, INTRAPALPEBRAL TEST, CAMP SEVIER.

The above illustrations show two reactors to the intrapalperbral glanders test, which Captain Howard C. Gale recently found at Auxiliary Remount Depot 310, Camp Sevier, Greenville, S. C., where he has been in command since last November. The one on the left, taken on the twenty-four hour reading was a seven-year old cavalry gelding. Autopsy showed lesions in the lungs, submaxillary, bronchial, mediastinal and renal glands. The one on the right, taken on the forty-eight hour reading, was a ten-year old cavalry gelding. Autopsy on this case also showed lesions in the bronchial and mediastinal glands. Captain Gale has more than 3200 animals left in his charge at the depot, after the sales, and so far has no information as to when the remount will be abandoned. Prior to his present assignment, Captain Gale was in charge of the veterinary corps at the remount depot at Camp Funston, from September, 1917, tNovember, 1918.

many handicaps and became one of the show places of France and still holds the record for achievements. The surgical work was extensive and the bacteriological laboratory established in connection did a lot of useful work in bacterin production and a considerable amount of valuable research work. The record of animals returned to service from this hospital was 89 per cent. Considering that only the worst cases were detailed there, it is a splendid record. The surgical equipment in the beginning was extremely inadequate. Major Saunders was obliged to depend upon his own kit for instruments and improvise such apparatus as irrigators, sterilizers, etc.

In 1917, Major Saunders was declared again fit for front line service, having entirely recovered from the effects of the poison gas, and ordered to assume the duties of D. A. D. S. V., First Canadian Division, and has remained with that division continuously since, having taken part in all actions at Hill No. 70, Paschendale, Arras, Amiens, Arras-Drocant-Queant Line, Cambrai, and so on until the signing of the armistice. He was with the First Canadian Division that marched to the Rhine, which was rough going. The following weeks at Cologne, however, were quite the reverse and afforded officers and men an opportunity to recuperate.

Major Saunders' priceless experience during more than four years in active duty, serving both at the front line where he was engaged in some of the most intensive battles of the war and serving for many months at a base hospital where 2,000 cases were under treatment daily, has been such as to give him an insight into surgical work such as has been the opportunity of very few.

In the British army the Williams' operation for roaring has completely eclipsed the English technic, and the radical operation for poll-evil is one of the wonders of the war. Major Saunders was told in the beginning that no cases would recover that had the ligamentum nuchae resected, but his results from the operation were such as to let himself in for all the poll-evil cases in the army for a long time. The stomach-tube was a seven days' wonder to the British army veterinarian, and it is not yet quite believed that it is possible to pass one.

Major Saunders is planning to write up his surgical experiences in the war.

Sales of Horses and Mules

Public auction sales of surplus army horses and mules conducted by the Remount Division up to March 1 brought a total of $11,414,997 to the government for 96,548 animals. These sales were held at thirty-six camps, cantonments and stations throughout the United States and the average price obtained was $118 per animal. The classes of animals sold consisted of cavalry and riding horses, light artillery horses, heavy artillery horses, wheel mules, lead mules, pack and riding mules. Auction sales of army horses and mules will be continued at the various remount stations in the camps and cantonments until the entire surplus stock of animals has been sold.

Veterinarians Stay in Europe

The veterinary corps attached to the Field Artillery of the Twenty-seventh Division was not in the parade which took place in New York City following the landing of the division. Forty-eight hours before O'Ryan's men started for home, the veterinary corps was ordered to join the Army of Occupation.

—

Lieut. Colonel Gerald E. Griffin, U. S. A., has been relieved from duty at Ft. Myer, Va., and directed to proceed to Atlanta, Ga., and take station at that place. He will act as General Veterinary Inspector in the following territory: Tennessee, New Orleans, Louisiana, Mississippi, Alabama, Georgia, Florida, North Carolina and South Carolina. Major R. M. Staley, U. S. A., now General Veterinary Inspector for that territory, will be relieved from duty on the arrival of Lieut. Colonel Griffin and will proceed to Washington, D. C., and report to the Surgeon General for duty. Major Staley contemplates an early return to civil life.

The duties of the General Veterinary Inspector for this district may be briefly summarized as follows:

(a) To co-operate with the Bureau of Animal Industry in the disinfection of public stables, yards and stock lines used in the transportation and collection of animals for or in the military service.

(b) Inspecting and reporting upon:

The sanitary condition of yards, depots, veterinary hospitals, horse lines and stables, etc., in his territory belonging to or used by the War Department and not under the control of the Department Commander, the methods used in handling animals therein, the efficiency of veterinary officers and upon such other offices that have a direct bearing on the Veterinary Service or on the prevention of disease and inefficiency of animals.

Veterinary Enlisted Personnel Medical Department

The General Staff have recognized that the Veterinary Corps, Regular Army, must have an enlisted personnel.

The re-organization plans for the Regular Army call for an enlisted Veterinary Corps personnel in the Medical Department. To determine the number of men necessary a ratio of forty enlisted men for each thousand authorized public animals has been used as a basis. The grades for this personnel will be similar to those now in the Medical Department so that the Veterinary Corps men will have the same opportunities for advancement as men of other branches of the service.

Authority for the enlistment of men for the Veterinary Corps, Regular Army, was published in the following circular:

Circular No. 141.
WAR DEPARTMENT,
Washington, March 24, 1919.

Instructions Governing Voluntary Enlistments—Amendment to Circular No. 113, War Department, 1919.

Paragraph 5, Circular No. 113, War Department, 1919, is rescinded and the following is substituted therefor:

5. Enlistment of men for certain special services * * * * * * * * * * * * Extract * * * *

Men who desire to enlist or re-enlist in the Veterinary Corps or Dental Corps will be enlisted for the Medical Department and will be transferred immediately to the Veterinary Corps or Dental Corps respectively, for assignment in accordance with the provisions of Circular No. 101, War Department, 1919.

(342, A. G. O.)

By order of the Secretary of War:
FRANK McINTYRE,
Major General, Acting Chief of Staff.

FIRST ENLISTMENT, VETERINARY CORPS, REGULAR ARMY.

On March 26th, 1919, two days after the authority for enlistments was published, Gabriel A. Wright enlisted at Camp Sherman, Ohio.

All Veterinary Detachment Commanders were immediately notified of this provision for an enlisted Veterinary Corps personnel in the Regular Army. It is hoped that the Corps will be able to obtain a considerable number of men by voluntary enlistment. All enlistments are for the grade of private but provision is made for promotion of those capable of performing the duties required of the grades. There are two enlistment periods authorized at present. For those who have had previous service they may enlist for either one or three years, while men without previous service will have to enlist for three years. Besides service in the United States, men will be required for duty with the American Expeditionary Forces, France, in Panama, Hawaii, Philippine Islands and China. An unusual opportunity is hereby offered for travel in foreign lands. It will probably be necessary for men who desire overseas service to enlist for three years. Men qualified as clerks, typists, stenographers, pharmacists, cooks, horseshoers, teamsters and stablemen will be needed.

Besides the opportunity for travel this service will offer training to men in horseshoeing, veterinary first aid, care and handling of animals, feeds and feeding, inspection of meat and milk products and horsemastership.

A Veterinary Artist

A real artist has been discovered in the person of 2nd Lieut. Horst Schreck, V. C., U. S. A. Lieut. Schreck has been on duty at Auxiliary Remount Depot No. 303, Camp Dix, New Jersey. While there he made some excellent paintings and pen and ink drawings of pathological conditions. His work has been pronounced as exceptionally accurate and realistic. Lieut. Schreck is now on duty at the Auxiliary Remount Depot, Camp Hancock, Georgia, and is devoting his time to the making of paintings and drawings of cases of dermatitis gangrenosa in the various stages of the disease. An accurate clinical history will be kept to accompany the drawings.

It is expected that the Veterinary Corps will be able to obtain some very valuable data in regard to this disease which has been prevalent in some of the Remount Depots and will be able to present to the veterinary profession original work along this line which will be of great scientific value.

The following orders of transfer and reassignment of veterinary officers have been issued during the past month:

1. Major John R. Scully, V. C., is relieved from duty as The Veterinarian, A. R. D. No. 327, Ft. Sill, Oklahoma, upon the arrival of Captain James R. Mahaffy, V. C.

1. Captain Forest R. Harsh, V. C., from duty as Camp Veterinarian, Camp Wheeler, Ga., to Camp Shelby, Miss., for duty as Camp Veterinarian.

2. Captain John P. Divine V. C., from Camp Dix, N. J., to Camp Mills, N. Y., for duty as the Camp Veterinarian.

3. Captain Harry R. Holmes, V. C., from Camp Sevier, S. C., to Camp Upton, N. Y., for duty as The Veterinarian.

4. Captain James R. Mahaffy, V. C., from duty as Zone Veterinarian, Eastern Purchasing Zone, Washington, D. C., to A. R. D. No. 327, Ft. Sill, Okla., for duty as The Veterinarian.

5. Captain Eugene J. Cramer, V. C., from Camp Wadsworth, S. C., to A. R. D. No. 320, Camp Custer, Mich., for duty as The Veterinarian.

1. 1st. Lt. George S. Place, V. C. from A. R. D. No. 319, Camp Zachary Taylor, Ky., to Animal Embarkation Depot No. 301, Newport News, Va., for duty as The Veterinarian.

2. 1st Lt. Roy J. Hock, V. C. from A. R. D. No. 318, Camp Sherman Ohio, to Philippine Department for duty.

3. 1st Lt. Herbert K. Moore, V. C. from Camp Wheeler, Ga., to Camp Lee, Va., for duty as assistant to the Camp Veterinarian and Meat Inspector.

4. 1st Lt. Charles E. Richardson, V. C. from A. R. D. No. 306, Camp Greene, N. C., to A. R. D. No. 309, Camp McClellan, Ala., for duty.

5. 1st Lt. Francis DeSales Houston, V. C. from A. R. D. No. 314, Camp Beauregard, La., to A. R. D. No. 309, Camp McClellan, Ala., for duty.

6. 1st Lt. Roy R. Washer, V. C. from Camp Lee, Va., to Camp Knox, Ky., as assistant to C. V. & M. I.

7. 1st Lt. Frank C. Meisner, V. C. from Camp Knox, Ky., to Ft. McPherson, Ga., for duty as Post Vet'n & M. I.

8. 1st Lt. Ralph B. Stewart, V. C. from Camp Jackson, S. C., to Ft. Leavenworth, Kan., for duty as Post Vet'n & M. I.

9. 1st Lt. Wm. D. Faison, V. C. from duty as Vet'n, 5th Cav., Ft. Bliss, Tex., to San Francisco, Calif., for duty as Transport Vet'n on the U. S. Transport "Dix."

10. 1st Lt. Homer Johnson, V. C. from Camp Hancock, Ga., to Camp Custer, Mich. for duty as Ass't to the C. V. & M. I.

11. 1st Lt. Robert S. Beattie, V. C. from A. E. D. No. 302, Charleston, S. C., to Ft. Bliss, Tex., for duty as Vet'n with the 5th Cav. that post.

12. 1st Lt. Wm. R. Wolfe, V. C. from A. R. D. No. 329, Camp Travis, Tex., to A. R. D. No. 317, Camp Pike, Ark., for duty.

13. 1st Lt. Geo. A. Handley, V. C. from duty with the Zone Supply Officer, Chicago, Ill., to Ft. Myer, Va., for duty as Post Vet'n.

14. 1st Lt. Edward M. Lynn, V. C. from duty with the Zone Supply Officer, Chicago, Ill., to Camp Pike, Ark., as Ass't to the C. V.

15. 1st Lt. Albert McGreevy, V. C. from duty with the Zone Supply Officer, Chicago, Ill., to Camp Travis, Tex., for duty as Ass't to the C. V.

16. 1st. Lt. Ralph M. Ward, from duty with the Zone Supply Officer, Chicago, Ill., to Fort Bliss, Tex., for duty as Ass't to the C. V.

1. 2nd Lt. Edward M. Juckniess, from A. R. D. No. 319, Camp Taylor, Ky., to Philippine Islands for duty.

2. 2nd Lt. Geo. W. Rawson, from A. R. D. No. 307, Camp Wadsworth, S. C., to A. R. D. No. 311, Camp Wheeler, Ga., for duty.

3. 2nd Lt. Frank O. Brostrom, from A. R. D. No. 318, Camp Sherman, Ohio, to Philippine Dept. for duty.

4. 2nd Lt. Chauncy E. Moorman, from A. R. D. No. 313, Camp Shelby, Miss., to Ft. Sam Houston, Tex., for duty with the 14th Cav.

5. 2nd Lt. Harry I. Stanton, A. R. D. No. 314, Camp Beauregard, La., to A. R. D. No. 309, Camp McClellan, Ala., for duty.

6. 2nd Lt. Herbert M. Armstrong, at A. R. D. No. 318, Camp Sherman, Ohio, in addition to his other duties assigned to duty with Field Remount Squadron No. 350 that camp.

7. 2nd Lt. Ward C. Timblin, from F. R. S. No. 350, Camp Sherman, Ohio, to A. R. D. No. 318, Camp Sherman, Ohio, for duty.

8. 2nd Lt. Harry E. Mitchell, from A. R. D. No. 329, Camp Travis, Tex., to A. R. D. No. 317, Camp Pike, Ark., for duty.

9. 2nd Lt. James E. Masterson, from Camp Jackson, S. C., to Ft. Leavenworth, Kan., for duty as Vet'n at the U. S. Disciplinary Barracks of that Post.

10. 2nd Lt. Frank R. Osborn, from A. R. D. No. 329, Camp Travis, Tex., to A. R. D. No. 317, Camp Pike, Ark.

11. 2nd Lt. Anthony J. Matter, from A. R. D. No. 326, Camp Cody, N. M., to Ft. Wingate, N. M., for duty as Post Vet'n.

12. 2nd Lt. W. W. Utzmann, from A. R. D. No. 326, Camp Cody, N. M., to Ft. Ringgold, Tex., for duty with the 4th Cav.

13. 2nd Lt. Oscar W. Anderson, from duty with the Zone Supply Officer, Chicago, Ill., to Camp Sherman, Ohio, for duty as Ass't to the C. V.

14. 2nd Lt. Joseph T. Mahoney, from duty with the Zone Supply Officer, Chicago, Ill., to Camp Bowie, Tex., for duty as Ass't to the C. V.

15. 2nd Lt. Lester W. Thiele, from duty with the Zone Supply Officer, Chicago, Ill., to Camp Kearney for duty as Ass't to the C. V.

16. 2nd Lt. Paul S. Christman, from Camp Wadsworth, S. C., to A. R. D. No. 307, Camp Wadsworth, S. C., for duty.

The following officers have been promoted to the grade of Captain for the period of the emergency to date from November 13, 1918. These officers are on duty with the American Expeditionary Forces, France:

1. 1st Lt. H. B. Balthazer.
2. 1st Lt. I. L. Barstow.
3. 1st. Lt. H. L. Blackburn.
4. 1st Lt. E. I. Cheely.
5. 1st Lt. Harold Clarke.
6. 1st Lt. W. M. Decker.
7. 1st Lt. G. L. Fallon.
8. 1st Lt. J. J. Essex.
9. 1st Lt. P. T. Gillie.
10. 1st Lt. G. W. Grim.
11. 1st Lt. H. H. Haigh.
12. 1st Lt. F. E. Jones.
13. 1st Lt. W. C. Keck.
14. 1st Lt. R. E. Kyner.
15. 1st Lt. C. J. McAnulty.
16. 1st Lt. R. B. McCord.
17. 1st Lt. H. C. McKim.
18. 1st Lt. N. S. Nutty.
19. 1st Lt. J. P. Porch.
20. 1st Lt. T. J. Quinn.
21. 1st Lt. G. T. Reaugh.
22. 1st Lt. D. S. Robertson.
23. 1st Lt. H. B. Roshon.
24. 1st Lt. R. W. Smith.
25. 1st Lt. Edwin Temple.
26. 1st Lt. J. R. Underwood.
27. 1st Lt. H. C. Vestal.
28. 1st Lt. A. C. Wight.
29. 1st Lt. F. F. Younglove.
30. 1st Lt. G. M. Zinkham.
31. 1st Lt. C. W. Likely.

The following officers have been promoted to the grade of Captain for the period of the emergency to date from February 17, 1919. These officers are on duty with the American Expeditionary Forces, France.

1. 1st Lt. C. R. Boshart.
2. 1st Lt. C. R. Farmer.
3. 1st Lt. C. L. Miller.
4. 1st Lt. W. C. Nickel.
5. 1st Lt. J. N. Shaw.
6. 1st Lt. O. J. Conzelman.
7. 1st Lt. P. H. Burnett.
8. 2nd Lt. C. S. Stirrett.

The following second lieutenants, V. R. C., were promoted to the grade of first lieutenant, V. G., U. S. A., to rank from November 13, 1918. These officers are on duty with the American Expeditionary Forces, France:

1. 2nd Lt. B. C. Bridges.
2. 2nd Lt. L. J. Brown.
3. 2nd Lt. J. E. Butin.
4. 2nd Lt. M. L. Claflin.
5. 2nd Lt. A. W. Combs.
6. 2nd Lt. B. H. Dunkley.
7. 2nd Lt. M. C. Fritzwater.
8. 2nd Lt. C. T. Guilfoyle.
9. 2nd Lt. E. M. Hough.
10. 2nd Lt. W. M. McLeod.
11. 2nd Lt. O. O. Long.
12. 2nd Lt. L. A. Marshall.
13. 2nd Lt. C. S. Parker.
14. 2nd Lt. J. F. Rogers.
15. 2nd Lt. H. M. Savage.
16. 2nd Lt. Thomas Shields.
17. 2nd Lt. L. R. Smith.
18. 2nd Lt. J. T. Traylor.
19. 2nd Lt. W. L. Williamson.
20. 2nd Lt. E. W. Youngblood.

The following Captains have been honorably discharged from the Veterinary Corps, United States Army:

1. Captain C. R. Sandberg, who was on duty as The Veterinarian, A. R. D. No. 322, Camp Dodge, Ia.

2. Captain A. H. F. Harmening, who was on meat inspection duty with the Zone Supply Officer, Chicago, Ill.

3. Captain Norris L. Townsend, who was on meat inspection duty with the Zone Supply Officer, Chicago, Ill.

4. Captain Thomas T. Rundle, who was on duty at the Veterinary Hospital, Camp Lee, Va.

5. Captain J. L. Wright, who was on duty as Camp Veterinarian, Camp Greene, N. C.

6. Captain P. H. Wallingford, who was on duty as Camp Veterinarian, Camp Humphreys, Va.

7. Captain Basil Bennett, who was on duty as The Veterinarian, A. R. D. No. 325, Camp Logan, Tex.

8. Captain Robert Graham, who was on duty as the Veterinarian at the Medical Department Laboratory, Ft. McPherson, Ga.

9. Captain Homer V. McCullah, who was on duty as the Camp Veterinarian, Camp Eremont, Calif.

10. Captain C. H. Carnahan, who was on duty as the Veterinarian, 13th Division, Camp Lewis, Wash.

11. Captain R. M. Hofferd, who has been on duty with the 92nd Division, A. E. F., returned to this country with that division and was discharged at Camp Upton, Long Island.

12. Captain R. A. Moye, who was on duty as Camp Veterinarian, Camp Sherman, Ohio.

13. Captain R. Porteuse, who was on duty as Camp Veterinarian, Camp Gordon, Ga.

14. Captain D. M. Hoyt, who was on duty as Camp Veterinarian, Camp Shelby, Miss.

15. Captain R. D. Chew, who was on duty as Camp Veterinarian, Camp Beauregard, La.

2nd Lt. R. L. Conklin, V. C., Regular Army, resigned March 12, 1919.

Major A. R. Kincaid, U. S. A., who was on duty as the Division Veterinarian, 17th Division, Camp Beauregard, La., has been honorably discharged.

The following 1st Lieutenants have been discharged from the Veterinary Corps during the past month:

1. 1st Lt. G. M. Smith.
2. 1st Lt. Rosser Lane.
3. 1st Lt. John Doerr.
4. 1st Lt. Edgar E. Williams.
5. 1st Lt. F. R. McNabb.
6. 1st Lt. G. W. Lies.
7. 1st Lt. Arnold J. Thompson.
8. 1st Lt. J. B. Barnes.
9. 1st Lt. E. J. Laing.
10. 1st Lt. W. F. Dixon.
11. 1st Lt. A. D. Kendrick.
12. 1st Lt. J. D. Corson.
13. 1st Lt. C. T. Dooley.
14. 1st Lt. G. J. Kigler.
15. 1st Lt. F. W. Heuben.
16. 1st Lt. C. P. Lamb.
17. 1st Lt. B. B. Flowe.
18. 1st Lt. R. D. Miller.
19. 1st Lt. R. D. Lorton.
20. 1st Lt. H. H. Hilman.
21. 1st Lt. S. M. Langford.
22. 1st Lt. O. C. Hackley.
23. 1st Lt. J. E. Syferd.
24. 1st Lt. F. W. Bratten.
25. 1st Lt. G. W. Hamilton.
26. 1st Lt. R. M. Thomas.
27. 1st Lt. E. S. Markham.
28. 1st Lt. M. L. Claflin.
29. 1st Lt. A. M. Combs.

The following 2nd Lieutenants have been discharged from the Veterinary Corps during the past month.

1. 2nd Lt. L. R. Montgomery.
2. 2nd Lt. R. F. Gard.
3. 2nd Lt. Julian Lyon.
4. 2nd Lt. E. L. Foos.
5. 2nd Lt. W. C. Bateman.
6. 2nd Lt. A. Sanders, Jr.
7. 2nd Lt. W. H. Roeschlein.
8. 2nd Lt. D. K. Williams.
9. 2nd Lt. Wm. G. Warren.
10. 2nd Lt. E. C. Hicks.
11. 2nd Lt. H. A. Milo.
12. 2nd Lt. G. B. Shinn.
13. 2nd Lt. O. H. Trout.
14. 2nd Lt. L. H. Mathers.
15. 2nd Lt. J. R. Wiley.
16. 2nd Lt. F. P. Murphy.
17. 2nd Lt. Wm. M. Long.
18. 2nd Lt. R. E. Duckworth.
19. 2nd Lt. Irving Moles.
20. 2nd Lt. M. W. Neidigh.
21. 2nd Lt. F. F. Buck.
22. 2nd Lt. P. H. Eagan.
23. 2nd Lt. C. McH. Greer.
24. 2nd Lt. C. J. Simmons.
25. 2nd Lt. Cecil Elder.
26. 2nd Lt. R. W. Broadhurst.
27. 2nd Lt. C. M. Lutz.
28. 2nd Lt. O. A. Cook.
29. 2nd Lt. L. J. Hinson.
30. 2nd Lt. M. P. Fuller.
31. 2nd Lt. J. F. Lineberger.
32. 2nd Lt. I. H. Arnold.
33. 2nd Lt. M. A. Quinn.
34. 2nd Lt. Wm. T. Pittinger.
35. 2nd Lt. Henry G. Smith.
36. 2nd Lt. F. L. Cissell.
37. 2nd Lt. E. P. Anderson.
38. 2nd Lt. C. E. Blosdale.
39. 2nd Lt. P. L. Matthews.
40. 2nd Lt. V. A. Holby.
41. 2nd Lt. F. S. Klein.
42. 2nd Lt. C. E. Wicktor.
43. 2nd Lt. R. G. Menefee.
44. 2nd Lt. S. A. Schneidman.
45. 2nd Lt. W. M. Henry.
46. 2nd Lt. Michael Shiply.
47. 2nd Lt. J. O. Ashley.
48. 2nd Lt. A. J. Allott.
49. 2nd Lt. D. L. Cecil.
50. 2nd Lt. H. A. Chapin.
51. 2nd Lt. George Wessels.
52. 2nd Lt. W. B. Hirleman.
53. 2nd Lt. C. B. Emerick.
54. 2nd Lt. S. D. Cronk.
55. 2nd Lt. H. F. Dailey.
56. 2nd Lt. T. S. Williams.
57. 2nd Lt. F. W. Beck.
58. 2nd Lt. S. R. Poulter.
59. 2nd Lt. J. C. Mitten.
60. 2nd Lt. F. F. Dowd.
61. 2nd Lt. E. J. Yocom.
62. 2nd Lt. M. L. Plumer.
63. 2nd Lt. H. E. VanDer Veen.
64. 2nd Lt. E. B. Oliver.
65. 2nd Lt. D. D. Dragoo.
66. 2nd Lt. J. J. Glover.
67. 2nd Lt. L. P. Sharp.
68. 2nd Lt. F. J. Trafton.
69. 2nd Lt. W. T. Vilott.
70. 2nd Lt. M. L. Hutchins.
71. 2nd Lt. E. E. Brosman.
72. 2nd Lt. O. N. Schultz.

Officers, Veterinary Corps, United States Army

	On duty Nov. 11, 1918.	On duty April 11, 1919.
Colonels	1	0
Lieut. Colonels	3	2
Majors	78	78
Captains	205	182
First Lieuts.	681	487
Second Lieuts.	1,216	555
	2,184	1,304

Movements of Returned Men.

Major A. R. Kincaid, late division veterinarian, Camp Beauregard, has repurchased his practice at Stonington, Ill., from Dr. W. M. Head who will locate at Atlanta, Ill.

Dr. Roland Thomas, late of the Remount Division of the A. E. F., France, has returned to his home at Klemme, Iowa, following his return from overseas.

Following his discharge from the service, Dr. George Wessels has resumed his practice at Creston, Iowa.

Dr. Roy C. Smith, late of Fort Sam Houston, has located at Enid, Okla.

Dr. A. A. Johnson has resumed his practice at Batesville, Ind.

After seven months spent in the service, Dr. D. L. Cecil, of Seymour, Ill., has reopened his office at Seymour.

Dr. Ray Mast, recently discharged from military service, has purchased the practice of Dr. Arthur Powell, at Coeur D'Alene, Idaho, who is leaving practice to take active management of his father's ranch.

After a year in the service, having had overseas orders which were cancelled following the armistice, Dr. J. H. Campbell has opened offices at Williamsfield, Ill. He says he is mighty glad to be back "in the dear old state of Illinois."

Dr. James H. Kernick, of Wilkinsburg, Pa., having returned from overseas service, is entering the automobile business.

Dr. L. W. Marner, who served during the war as meat inspector, has purchased the practice of Dr. Hanchett, at Wellman, Iowa.

Rank, Pay and Allowances for Veterinarians

On August 20, 1918, the comptroller approved the auditor's decision that there was no authority for the appointment or promotion of a veterinarian now in the Army as defined by Par. 4, Sec. 16, Nat. Defense Act, June 3, 1916 to the grade of Major, Veterinary Corps.

On October 9, 1918, the comptroller ruled that the Selective Service Act of May 18, 1917, did not authorize the appointment in the temporary forces raised thereunder of colonels, lieutenant-colonels and majors in the Veterinary Corps.

On December 6, 1918, the auditor ruled that there was no authority for the promotion of veterinary officers except as provided in Sec. 16, Nat. Defense Act, June 3, 1916, which requires five years' service to a first lieutenancy, etc.

From the time the first opinion was received at the surgeon general's office until a final decision was rendered by the comptroller, the director of the Veterinary Corps has been untiring in his efforts to have these opinions reversed and consequently secure for the officers of the Veterinary Corps their just status. It is a source of great satisfaction to be able to report the success of these efforts.

On April 9, 1919, the comptroller rendered a decision which reverses the ones above referred to. The grade of major in the Veterinary Corps, Regular Army, under the National Defense Act of June 3 1916, for veterinarians now in the Army after 20 years' service is held to be authorized. Payments made or to be made to men commissioned in the Veterinary Corps as colonels, lieutenant-colonels, majors, captains, first lieutenants and second lieutenants will not be disturbed by the accounting officers if correctly made in other respects.

It is expected that prompt action will be taken by the War Department to restore the grade of major for the Veterinary Corps in the Regular Army.

BOLSHEVIKI SUFFER FROM GLANDERS

The British government has published as a "white paper" a collection of reports on bolshevism in Russia. A portion of the report indicates that horses and asses are not the only animals among which glanders may become widespread; or does it? Here is the paragraph:

"Typhus is rampant everywhere and is getting worse every day. There is also a lot of typhoid fever about, but worse than this, glanders is now spreading among the people. The Bolsheviki are afraid of this terrible disease spreading far and wide, so they simply shoot any person suffering from this complaint. There are no medicines there by which they can attempt to cure people, and there is, of course, a great shortage of doctors."

WE OWE IT TO THEM

We owe it to the thousands who went down to death on the blood-stained fields of France, to go through with this Victory Liberty Loan as Americans should. That means we must all buy to our limit. Have you bought yours?

ARMY FLY CAMPAIGN

(*Continued from page 228*)

The material suitable for breeding must possess two properties, heat for the ovum and predigested or otherwise readily assimilable food for the larva. Flies therefore oviposit in fecal matter which provides both needs better than any other material. They prefer fresh horse droppings because of the freedom from the continuous caking of the surface which occurs with bovine feces. In temperate climates stable litter especially a few minutes after the dropping hits the floor, is chosen by the ovipositing fly in 90 per cent of cases, and one pound of litter has produced 45.5 larvae. Human feces are the most common choice, especially in warm climates. Other fermenting or putrefying matter of vegetable origin will also serve, but it is not generally known that as a last resort ova may be deposited on damp rags and even on wet paper.

As the first warm thawing days of early spring set in, we begin our fight against the fly. In at least fourteen days in a temperate climate we will see the first appearance of the flies for the season. We attempt to destroy all material that harbors the eggs, larvae and pupae, and in this way reduce to a minimum the first flies. The flies that do appear we seek to catch by the general use of fly catchers or kill by use of the swatter. All drainage ditches are cleaned and drainage corrected if necessary, including the ditches about the barracks, mess halls, and latrines. No pools of water are allowed to stand and become stagnant. The barrack streets and other streets are policed twice to three times daily for gathering up of all filth. The garbage is hauled away daily and the cans are scalded out to keep them free from grease. The screens on all buildings are examined and repaired if necessary and fly catchers are placed about the door ways of the mess halls, barracks and latrines. At the stables there are specially constructed dumping floors or grounds. These spaces are large enough to hold a day's accumulation of horse manure. This space may have a solid cement floor, but for all practical purposes a floor of tamped clay allowed to become hard is sufficient. This floor area is sprinkled with an emulsion of crude oil in soap and water. Sufficient men are kept constantly about the stables to collect the droppings as they appear and to deposit the same on this dumping floor. As the manure is thrown uopn this floor it is sprayed with the emulsion. In the morning the accumulation of the day before with the morning collection is hauled away.

We know that in 90 per cent of the cases the ovipositing fly deposits her eggs on fresh horse droppings a few minutes after they hit the floor. The treatment with this emulsion will prevent the hatching of these eggs. If some hatch, the larvae are found dead lying on this oiled, hard, clay floor. Finally since this accumulated manure is closely packed, the heat generated four inches beneath the surface is 136° to 169° F., a temperature which will destroy the egg and kill the larvae. In this way the production of flies is kept down to the minimum.

Whenever it is necessary, swatting squads are employed morning and evening about the stables, latrines, and mess halls to kill the flies that are present.

The latrines and garbage cans are fly proof so the fly doesn't have an opportunity to become infected.

The water is sterilized; in most instances chlorinated. The food supplies are kept in fly proof store rooms. Each day the mess halls receive fresh supplies sufficient for the day, and all foods except fresh fruit are served cooked. Cooked foods when possible constitute a factor not to be forgotten.

If we can from early spring and throughout the summer season successfully diminish the number of flies, give no opportunity for infection to the fly, and have a pure water supply we have done much to keep the camp free from disease. A successful campaign against flies means a more certain control of the gastro-intestinal diseases of the soldier.

CARBOLIC ACID IN THE TREATMENT OF "DOWNERS"

What is the value of carbolic acid in the treatment of crippled pigs? I mean pigs that seemingly become paralyzed behind and are apparently otherwise in good health.

REPLY: None.

Dr. Otis Bloomfield, formerly in practice at Astoria, Ill., has moved to Williamsfield, Ill. This leaves Astoria without a veterinarian.

DEPARTMENT OF

BOVINE PRACTICE

Edited by JOHN FRANCIS DE VINE, D. V. S.

Parturient Paralysis, Parturient Apoplexy

SYMPTOMS AND DIFFERENTIAL DIAGNOSIS

AS with most diseases, the initial symptoms do not always occur with mathematical precision; the onset may be so slow as to in some way attract the attention of the caretaker, or it may be so rapid that the animal will have fallen or be about to fall before it has been noticed to be ailing at all.

Even in cases where the onset is comparatively slow, the symptoms manifest in an early stage of the attack might be quite deceiving to one who had seen but a few cases previously. Occasionally the first thing to be noticed by the attendant is the decrease in the milk flow, the animal showing no positive evidence of the ailment for several hours after milking. While, again, even in dairies where the milk is regularly weighed the records will show that within a few hours after having given the usual amount, the animal evidenced pronounced nervous disturbances; still in other cases the first thing observed is that the animal refuses its feed, ceases to chew its cud, and stands listlessly for a short time, followed by jerking of the body muscles, particularly the muscles of the neck, flanks and legs; rolling the eyes about in their sockets, and in some cases even champing of the jaws and stamping of the feet, which at first might be taken to indicate severe abdominal pain.

Exceptionally there is even more decided excitement; the animal jumping about and occasionally bellowing.

However, the opposite may be true in other cases, the nervous symptoms being very mild or wanting, the animal manifesting more of a weakness, staggering and trembling, sometimes half falling and struggling about for a time, finally going down, making subsequent efforts to rise, which often leads stock owners to believe that the animal has injured its back.

After falling the animal may lie for a time in an apparently normal position, resting on the sternum with its head held rather high; later rolling more on the side, usually the left side with the head resting on the ground against the flank. From now on there is every evidence of progressive paralysis. The bowels cease to be active, the bladder loses its contractile power, the muscles of deglutition become sluggish and finally powerless; the breathing slow and stertorous, the pulse exhilarated and the temperature subnormal, probably due, in part at least, to a relaxed condition of the sphincter ani muscle. Coma sets in and the animal is more or less insensible, but shows irregular convulsive struggles to regain her feet for a time, in which her head is thrown violently about.

As the disease progresses the convulsions give way to a more complete prostration with a tendency to lie prone on the side with the muzzle extended and the head drawn back in a semi-opisthotonos position, the eyes drawn and the pupils greatly dilated. After an animal has laid on its side for a time the rumen tends to become filled with gas due to fermentation of its content, which gives rise to two dangerous and serious conditions, namely, excessive tympany, which in itself endangers suffocation by pressure on the lungs or the tendency produced by the bloating to press the food up through the esophagus into the pharynx. The animal being unable to properly control this ingesta from loss of power of the muscles of deglutition, the substance is sucked back into the larynx and inhaled into the lungs causing either

immediate fatal strangling or later mechanical pneumonia and gangrene.

The pulse now becomes irregular, general sensation less and less, the cornea even failing to show reflex when touched. If the head be picked up and allowed to fall it will fall as if the animal were lifeless. As paralysis and coma become more profound, it is evidence of approaching death; however an animal may live several hours in what appears to be an almost lifeless condition.

In cases where the malady occurs early after parturition, or the animal is a particularly deep milker and high in flesh, death may ensue in from six to eight hours from the beginning of the attack, while some cases may linger two or three days.

Differential Diagnosis

In the early stage there is a possibility of confusing parturient paralysis with colics, hydrophobia, tetanus or eclampsia; and later with puerperal septicemia, vacuity of the rumen or so-called railroad sickness, digestive paralysis, true apoplexy, pressure on the central nervous system, acute hydrocephalus, myelitis and meningitis, also mammary infections. There are of course other conditions such as fractures and post-partum paralysis that might deceive a novice but should not an experienced veterinarian.

The three things that will be perhaps the uniform guide in directing our attention toward the diagnosis of parturient paralysis from other ailments are:

1. It is so often closely associated with parturition.
2. The general physicial appearance of the animal, with reference to its nourished condition.
3. The history, eliminating probable injury and violence.

It is always a good custom where there arises in the mind of the attending veterinarian, a question as to the nature of the malady, to have the animal (if able to stand) moved about. Ordinarily the peculiar unsteady gait and the extended position of the head will lead one to eliminate abdominal pain. The unsteadiness rather than stiffness will likewise help one to disregard tetanus, which is a comparatively rare affliction in the bovine. The suddenness of the attack should eliminate rabies. Rabies in the cow, as in other animals, let the attack be ever so acute, is always attended with premonitory symptoms of a longer duration than parturient paralysis.

If, however, rabies is prevalent in the locality and the nervous symptoms predominate, the patient's behavior, in the presence of a dog or cat would be an advantage in making a more certain diagnosis.

The character of the spasms not intermittent, as in eclampsia, point to a difference between this disease and eclampsia. It is likewise well to keep in mind that eclampsia in a cow is rather unusual.

Puerperal septicemia is characterized by inflammatory changes in the genital organs and usually the attendant rise in temperature and febrile symptoms. Parturient paralysis is afebrile.

Vacuity of the rumen and digestive paralysis strikingly resemble at times parturient paralysis, but can usually be eliminated either by the history or degree of intensity.

The former is necessarily preceded by want of food for a long period, as might be occasioned by a considerable journey. Digestive paralysis in my experience has not been as sudden in its onset or as acute in type as true parturient paralysis; while paralysis is usually associated with more or less stupor the acute brain symptoms, violence, convulsions and deep coma I have never seen present.

True apoplexy, pressure on the central nervous system, acute hydrochepalus spinal myelitis and meningitis, are conditions that are often only suspected after we have applied our usual treatment and the animal fails to respond.

Udder Infections

Parturient paralysis is also to be differentiated from paralysis of the posterior part of the body resulting from acute mammary gangrene.

Only recently I saw two cases of severe gangrenous mammitis, in consultation with another veterinarian. Paralysis and great prostration were the pronounced symptoms, but in both cases while the calves had been carried full term, the placenta had been held and there was a copious abortion discharge, the membranes decomposing with great rapidity, being allowed to protrude and receiving no sanitary attention. The udder and hind parts were filthy

with the discharge, acute mammary gangrene, puerperal septicemia and prostration developing in from thirty-six to forty-eight hours after calving.

The veterinarian in charge advised me that three animals in the same herd had died within a fortnight, exhibiting the same symptoms; he having treated them all for parturient paralysis without avail; however, the pronounced udder symptoms with the rapid gangrenous discoloration preceding prostration should be sufficient guidance to differentiate this from true parturient paralysis. The instant we applied sanitation to the genital tract and stable, and so protected the udder, the trouble ceased. We may have a similar confusing paralysis and coma from mammary toxemia, even where the mammitis seems surprisingly mild as compared to the severe systemic disturbances it occasions. In such cases our differential diagnosis will need to be based largely upon the general condition, with particular reference to lack of plethora and the evidence of mammitis in a greater or lesser degree.

The possibility of pyemic arthritis resulting from purulent mammitis or puerperal septicemia should be kept in mind. For differentiation from the latter see puerperal septicemia, which is to be discussed in a later article.

Complications

The most frequent complications are extreme tympany, suffocation and mechanical pneumonia, the latter due in some cases to the fermenting ingesta, but more often produced by drenches, where the attendant is ignorant of the fact that when the animal is prostrate she cannot swallow and that any drench given is poured directly into the lungs.

Another complication which writers on veterinary obstetrics seem to have failed to consider and one of the complications to be feared where the attack is particularly severe and the animal has been suffering for several hours without receiving proper relief, is acute uremia, which is manifest by clonic contraction of certain sets of muscles, followed by general epileptiform convulsions as the animal lies prostrate on its side. Such a case in addition to prompt catherization and inflation of the udder should receive the most judicious hypodermic medication of diuretics and diaphoretics, choral per rectum and lobeline subcutaneously are also indicated. Arecolin and strychnin in these cases are dangerous and almost surely fatal.

Pathology and Treatment, next article.

Special Veterinary Fees

Whenever the client requests the practitioner to use a special conveyance, the additional expense so incurred should be charged to the client.

When the client does not specify the means for the veterinarian's arrival he cannot be charged for the same, and the charge can in justice be made only on the customary mileage basis. The veterinary practitioner's equipment must include some form of conveyance. The client pays in part for the up-keep of this conveyance when he pays the mileage fee.

When the practitioner has no conveyance and is obliged to hire one he cannot in justice, charge the expense to the client unless the latter has ordered it and agreed to it.

When the matter of conveyance is an item to be considered, allowance must be made in the fee in instances where the client furnishes the conveyance himself.

Some of the recommendations that have been made in these articles may not always prove profitable immediately. In the end, however, they pay good interest in the form of popularity, friendship and increased patronage.

They are especially to be considered by the young graduate who is just beginning to build up a practice in any community. While it is not always easy to make allowances for odd and unusual circumstances it usually pays to give the client a "show for his money."

Per Diem Valuation of Services

The practicing veterinarian is at times requested to place his charges for services rendered at a daily wage figure.

This is customary when the service is to be rendered a long distance from the practitioner's office, and where it

would be impracticable to figure the service fee upon any other basis.

The fee for such service would be governed by the nature of the service, upon the veterinarian's income, and by the effect that such service would have upon the income. Custom also is a factor to consider in making a charge for such service. In some localities it is customary to make a charge of ten dollars per day, all expenses incidental to the service to be paid extra. In other localities the customary fee is twenty dollars per day. The veterinarian should not be too observant of custom on this point. While some veterinary practitioners can afford to serve for ten dollars per day with profit, another veterinarian in the same locality might lose money at the rate of fifty dollars per day.

The rate should be higher for a short period of time than for a longer period. No veterinary practitioner, no matter how limited his practice, should serve one day for less than twenty-five dollars.

There are a few veterinary surgeons in the United States who charge as much as one hundred and fifty dollars for a day of their time, and one or two who charge even more than this.

The time charged for begins when the veterinarian leaves his headquarters and terminates with his return thereto. All expenses incurred, such as railroad fare, livery hire, hotel billls, are to be paid by the client unless it is otherwise stipulated.

The profit that is in such service must not always be figured upon the wage earned. In many localities the advertising value of a call many miles from home has a good effect upon the communty in which the veterinarian is located. While this is an intangible assett it deserves consideration.

When the service is to be rendered in a community that has a local practioner the veterinarian rendering the service should exact a higher fee than he would if there were no other veterinarian available.

When the condition to be treated is in the class of surgery conditions, the fee charged for the operation performed should be added to the daily fee. The fee charged for the operation should be at least as high as the practitioner would charge for a similar operation in his own territory.

On the whole, the motto among veterinary practitioners in general is "get all you can" for these engagements. This motto is legitimate when there is another practitioner in the community. When the community is at the mercy of the veterinarian engaged this motto is not fair. Nevertheless, as this source of income is not steady, and as it often interferes with the smooth conduct of a home practice, the veterinarian is quite justified in making his fee as large as the circumstances will permit.

M. R. Steffen.

Milwaukee, Wis.

APOMORPHIN

Apomorphin hydrochlorid is prepared from morphin by the extraction of one molecule of water, its formula is $C_{17}H_{17}NO_2HCl$. Apomorphin is, therefore, an artificial alkaloid. It is a white or gray powder which in aqueous solution and at times in tablets may turn green. This, in spite of assertions to the contrary, does not reduce its therapeutic efficiency. The color may, however, be dissipated by a few drops of dilute acetic or hydrochloric acid.

Pharmacology.—Apomorphin is a physiologic emetic acting through the vomiting center without gastric irritation. In animals that vomit the action is prompt and effective and of decided service therefore in poisoning. In morphin and strychnin poisoning the stomach is emptied by apomorphin with (in case of the latter), the subsequent administration of H-M-C, or morphin to quiet.

For choke in horses, from oats, apomorphin is efficient in from three to five minutes in a dose of one-half to one grain hypodermically. This may be repeated in one-half to one hour if necessary.

In small doses apomorphin is an efficacious expectorant, acting by liquefying the secretion of the bronchioles in capillary bronchitis, and, according to Quitman in chronic dry coughs. In strychnin poisoning, in addition to emptying the stomach, it acts as a physiologic antidote.

Administration.—As an emetic apomorphin is given hypodermically, one-twentieth grain being an efficient dose for the average sized dog. Except in strychnin poisoning, very much larger quantities may be necessary. For capillary bronchitis one-sixtieth grain every hour is indicated to be given preferably in solution and by the mouth.

Chicago. Frank B. Kirby.

Department of Live Stock Poisoning

By L. H. PAMMEL, Ph. D., Ames, Iowa
Professor of Botany, Iowa State College

Readers are urged to take advantage of the opportunity offered by Dr. Pammel, for the identification of specimens of supposedly poisonous plants. Two good-sized specimens, carefully packed, should be sent to him direct, with such history as may be available. Simply mention that you are a reader of the AMERICAN JOURNAL OF VETERINARY MEDICINE and no charge will be made for this service.

Range Plants Poisonous to Sheep and Cattle in Nevada

PROF. C. E. FLEMING in a bulletin on range plants poisonous to sheep and cattle in Nevada,[1] places the poisonous plants in seven groups as follows: "Death Camas, Larkspurs, Water Hemlock, Rabbit Brush, Lupines, Western Goldenrod, and the Locos. Those of less importance are: False Hellebore, Wild Cherry and Aconite." Some of the groups contain several species each. The feeding tests were made by Dr. Edward Records and Dr. Stephen Lockett, of the Department of Veterinary Science, and the chemical studies by Dr. C. A. Jacobson. Prof. Fleming, who is head of the Department of Range Management of the Agricultural Experiment Station, made the field observations on the ranges. Each of the species is described and its distribution and habitat given under each plant. The author gives the animals which are poisoned, amount necessary to cause death, the symptoms and treatment in regard to larkspur, he says:

"On all ranges there should be plenty of salt where the cattle can get it all the time. When larkspur is growing on the range, the salting grounds should be placed where they will be away from the larkspur patches. This will help to keep the animals from bunching and feeding where the larkspur plant is abundant. The salting grounds should be continuously changed, so that no part of the range will be badly overgrazed. After the larkspurs have blossomed the infested areas may be grazed with a minimum chance of loss taking place.

"The choice of range plants is greatly influenced by the hunger of the animals. When the stomach is empty and the animals are very hungry they will eat many plants that they ordinarily would not touch. On a list of plants pleasing to the taste of cattle, the larkspur will not be among the first if there is much variety of forage present. When eaten in small quantities the larkspur causes no serious ill effect, but if eaten in large quantities by hungry cattle some of them will undoubtedly get enough to cause death. Therefore, it should be a general practice never to drive stock over larkspur country while their stomachs are empty. At all times cattle should have the greatest possible chance to select the plants they like. This means that fast trailing and grazing from one range to another must be discontinued if losses from poisonous plants are to be curtailed."

In regard to poison camas or death camas he says: "This plant is poisonous to all classes of stock, but more especially to sheep. Horses very seldom die as a result of eating it, though cattle are sometimes lost in the spring when they are turned out in very poor condition, or when they are being driven over badly infested areas. While being trailed they are usually extremely hungry and will nip and bite at all plants whether good or bad."

In regard to western hemlock, he says: "So far all of the feeding experiments indicate that the only poisonous part of the plant are the roots. The leaves and stems in large quantities have been fed to sheep and cattle with impunity. It is the most poisonous plant which we have on our western ranges, although it does not cause as many losses as some of the other poisonous plants, due to its restricted distribution and the more or less limited possibility of the animal pulling up and eating the root."

"It takes from 20 to 40 minutes for the poison to be absorbed after the plant has been eaten so as to cause the first symptoms, which are frothing at the mouth and pronounced uneasiness with extreme pain, more especially in abdominal region."

Prof. Fleming states that the rabbit bush (*Tetradymia glabrata*) is poisonous at certain times of the year. It is one of the mustards and I do not remember having noted that this

[1]Bull. Nevada Agrl. Exp. Sta. 95: 1-51 *f. 1-23, pl. 1-6 colored.*

plant is poisonous. The plant grows with *Atriplex, Eurotia* and greaseweed in the western Rocky mountain region.

"During the spring of the year this shrub produces many young buds and leaves on which the sheep graze, and consequently it is this part of the plant which has so far been responsible for all the losses. In fact the remainder of the plant is so very woody and tough that it would not be eaten by any class of range stock.

"The fresh young leaves and buds contain about 2 per cent of potash, a violent poison which may be the cause of the death of the sheep. Some sheep can eat far more rabbit brush than others without being poisoned.

"After a sheep has filled up on the young green shoots the animal first appears to be very dull and somewhat senseless. It staggers and is weak. When grazing or standing still it may suddenly fall over in an insensible condition, with the head bent or moved to the side of the body. Muscular spasms follow; the eyes are bulged and staring; the breathing is very shallow. When breathing, the nose and face are wrinkled as though the nose were blocked with some obstruction. Grinding of the teeth is fairly common in all animals down, and after a while bloating takes place. Swelling of the ears and head occurs in many cases. Mucus streaked with blood usually flows from the nose. After the animal falls, death usually follows in from five minutes to an hour.

Notes on Poisonous Plants

Dr. E. T. Baker, well known for his work on sheep diseases, has recently issued typewritten sheets on plants poisonous to sheep. He begins by giving some general directions for collecting poisonous plant material. In the manuscript before me he lists the following: Western golden rod (*Solidago spectabilis*), cocklebur (*Xanthium Canadensis*), Johnson grass (*Andropogon halepensis*), mullein (*Eremocarpus setigerus*) which in the west is commonly called turkey mullein, false hellebore (*Veratrum Californicum*), stagger grass or crow poison (*Chrosperma muscaetoxicum*) described in a recent issue of the AMERICAN JOURNAL OF VETERINARY MEDICINE, beets and beet tops (*Beta vulgaris*), vetch (*Vicia villosa*), white snake root (*Eupatorium urticaefolium*), fern (*Pteris aqualina*), milk weed (*Asclepias*), oak (*Quercus gambelii*, and *Q. Havardii*), Western laurel (*Menziesia glabella Azalea occidentalis. Rhododendron*, sneezewood (*Helenium Hoopesii*). Dr. Baker, I presume, plans to publish a revision of his work on sheep diseases, in which this material will be incorporated. He says: "There is such a wonderful interest taken in plant pathology and especially the western sheepmen are beginning to realize its importance. I find from practical experience that veterinarians and sheepmen want to know the following about plants injurious to stock:

"How to identify the plant.
"Where to look for it.
"What part is toxic?
"When?
"What are the symptoms?
"What antidote, if any?

"These are the facts I have tried to incorporate in my little book, for quick reference.

"If there are any plants causing trouble in your part of the country or in Ohio or Pennsylvania, two good sheep states, I shall be glad to hear from you in regard to them."

The subject is taken up under botanical name, symptoms and treatment. In regard to the cocklebur, he says the plant destroys at least a quarter of a million dollars worth of wool every year in the United States.

Frozen Beet Tops

Dr. L. E. Pike, of Lyle, Minnesota, writes as follows concerning frozen sugar beet tops:

"Am writing you to inquire if you know of any poisonous principle in frozen sugar beet tops that would cause the death of horses.

"A client of mine has lost two horses and he informs me that the only feed out of the ordinary they had received was beet tops.

"I saw one of these horses at night, after he was down so can't give you the symptoms very accurately. The owner said the horse had been off feed and sluggish for about a week and didn't drink much water, but that his bowels were regular.

"The night I saw him his pulse was weak and slow, temperature subnormal, membranes anemic. He seemed to have no pain. The owner said he noticed no signs of uneasiness during the week he was sick. He died the second day after I was out.

"The owner informed me today that he had lost another horse, which acted the same, except that he only lived a few days."

Beets and Beet-Tops

The following account is taken from Dr. Baker's manuscript on Beets and Beet Tops.

The botanical name for beets is *Beta Vulgaris.*

In the large beet-raising districts of the West, sheep are also extensively produced and fed on beet-pulp or beet-tops. The most important sugar beet localities in the West are southern Idaho, Utah, Colorado and the central parts of Montana and Washington.

In the early fall, the sheep are fed the tops, and later, the pulp. In some years this feed is very harmful; in others no trouble whatsoever ensues. Just why this is, no satisfactory answer has been given.

In sheep the symptoms may assume the form of a mild toxemia, characterized by loss

of appetite, impaction, followed by diarrhea, and recovery in a few days. Others may be stricken as in acute poisoning, and enteritis, bloody diarrhea, hematuria and convulsions, followed by death result. Whether molds or oxalic acid cause these mild or severe symptoms has not been fully determined as yet.

An analysis of sugar beet-tops reveals the following composition:

Water	86.67 per cent
Proteins	1.69 per cent
Fat	0.28 per cent
Nitrogen—free extract	7.81 per cent
Fiber	1.53 per cent
Sand	1.57 per cent
Oxalic acid	0.35 per cent

The anatomical changes are: more or less of whitened visible mucous membranes; the gullet is unusually pale; the intestinal mucosa slightly congested, while the blood is dark and with little proclivity to coagulate.

Treatment: Tablespoonful doses milk of magnesia can be given every half hour, followed by a little flaxseed jelly. Sprinkling ordinary slacked lime very slightly over the beet tops will neutralize the oxalic acid, and also the molds, if not too extensive, and the tops have not been frozen. For the abdominal pain, any of the carminatives can be given.

One-night Camps vs. Established Bed-grounds on Nevada Sheep Ranges

Prof. C. E. Fleming says it is customary in Nevada, and this is common in other ranges of the public domain, to make a permanent bedding ground to which the sheep are returned each night until all of the forage within a radius of three miles of the bedding ground is used, then a new camp is established. In this way the forage is cut up and destroyed by the hoofs and there is material loss of flesh in both ewes and lambs. This is in the main an animal husbandry problem which is discussed here. It has been shown conclusively that the bedding out system is favorable to increased mutton production.

"The increased money value at 14 cents per pound for a flock of 1,500 lambs would amount to 1,500 times 5.05 pounds times .14 or $1,060.50. This would represent just that much more profit to the sheep owner and would go a long way toward paying the summer operating expenses of a band of ewes and lambs.

"The above increase in the weight of lambs when handled under the bedding-out system is primarily due to the following factors: (1) The ewes are on fresh feed every day with many different kinds of plants to select from, and, as a consequence, their milk supply is proportionately higher than the ewes which are forced to eat feed which has been already grazed over or feed which requires one to three miles trailing each day to secure; (2) the loss of time and energy consumed in trailing from an established camp is entirely eliminated; (3) the ewes and lambs are in most instances allowed to graze at all times just as openly and quietly as possible, giving them the greatest possible range freedom in the selection of their feed with the least amount of dogging, trailing, and running taking place; and (4) the ewes are allowed to choose range forage conducive to the greatest milk supply and production of wool and mutton."

Poisoning from Horsetail

Dr. J. L. Ackerson, of Milan, Michigan, sent me a specimen of hay containing horsetail, with explanation as follows: "This plant is mixed with good hay (timothy and red clover) and I have lost a number of horses with cerebrospinal meningitis, whose principal diet consisted of this hay. The first symptom is a marked paralysis and cough with normal pulse and temperature. The appetite remains good until the last stages."

This weed is common in many sections of the United States, especially in the north. The disease it causes is equisetosis. The common horsetail (*Equisetum arvense*) grows in acid soils, damp sandy soil being its favorite habitat. The dry plant also seems to be poisonous and young horses seem to be most susceptible. This weed does not cause cerebrospinal meningitis. It does, however produce a form of paralysis.

In my "Manual of Poisonous Plants" the following statement is made:

"*Symptom*: The effects of poisoning from eating horsetail appear at times varying from two to five weeks, depending upon the age of the animal and the amount of contaminated hay ingested.

"The first symptoms are usually unthriftiness, generally bodily weakness and emaciation. The animal seems to have a depraved appetite, preferring the plant to wholesome food. As the disease progresses the muscular weakness becomes more pronounced, the animal loses muscular control and exhibits incoordinate movements. During this stage the pulse and temperature are depressed, extremities are cold and the visible mucosae are pale. The appetite usually remains good until the end and consciousness is apparently retained. Finally the animal falls, manifests nervous excitement, paroxysms of convulsions appear and death results from exhaustion. In the final stage the pulse becomes accelerated and the temperature elevated.

Hypostatic pneumonia is a frequent complication.

Treatment: The first step in the treatment is the removal of the cause. A cathartic should be administered to rid the bowels of the irritant and nerve and heart stimulants given to

combat the symptoms of depression. If the patient is unable to stand, it is advisable to give some support. When the animal is down it becomes necessary to guard against the development of hypostatic pneumonia.

Where cases are not too far advanced and appropriate treatment is instituted, recovery is usual. (Stuhr.)

A Disease Resembling Braxy

Professor E. W. Murphy, of Hamilton Victoria, Australia, sends me a clipping from an Australian paper containing an account of a disease which is quite serious in that region. The article in question, says Professor Murphy in commenting on the trouble, states: "It may interest you to know that various phases of obscure disorders afflict stock throughout Australia. I append a cutting from a western Australia paper. In Victoria and in New S. Wales the disease is called 'Black Disease.' In South Australia it has various place names. Dr. Dodd, of Sydney University, has been exhaustingly experimenting for bacteria. In the December *Agricultural Gazette*, N. S. Wales Govt., he admits failure to identify a specific germ. He says: 'From the description of the morbid anatomy and histology of sheep dead of 'black disease,' it will be seen that the indications are those of a severe toxemia, although nothing has been demonstrated either clinically or experimentally to account for the condition.' This disease like the trouble in South Africa, which Sir Arnold Theiles was looking into for so long, is always on "sour" lands. The work by Forbes of Ohio clearly explains the toxemia as developing from the shortage of alkali, which N. S. Wales Govt. officials known to exist in grasses."

"The percentage of deaths varies on certain farms and in certain years, but on badly infected farms its ravages amongst sheep may be averages at from 10 to 40 per cent.

"As a rule, in the field very little can be said on that head, owing to the fact that the affected animal dies so rapidly, and not infrequently the first intimation that braxy is present is the finding of the sheep dead and the carcass very much distended with gas, the fattest sheep as a rule being the victim. A few hours before death the temperature rises 105° to 108° F., the breathing becomes labored, the head depressed, and frequently the belly becomes tympanitic. One of the most noticeable features is the early putrefaction of the carcass. It appears that this is caused not by the ordinary organism of putrefaction, as is usually the case, but by the braxy bacillus. In fact, even after putrefaction is very far advanced, the organisms are conspicuous by their absence, and the ordinary liquids of the body fairly teem with the braxy bacilli, which can be found in the peritoneal liquid in almost pure culture even days after the death of the animal.

"On opening the abdomen the first three stomachs are found to be distended with fodder, while the fourth, or true digestive stomach, is empty or contains only a little brownish colored liquid, consisting of blood-stained mucus, which when examined microscopically, is found to be teeming with bacilli. The veins on the surface of the fourth stomach are distended and exude coloring matter from the blood, which after death stains the organ a vivid crimson, and this is frequently mistaken for acute inflammation."

Sesban or Mole Bean Poisonous

Dr. M. G. Smith of Wilmington, N. C., sent me a small specimen of sesban (*Sesbania platycarpa*) with the following letter:

"I am mailing you a specimen of a bean that grows wild in Brunswick county, North Carolina, within a few miles of the seashore. The farmers here call it the mole bean and say it poisons their cattle every fall. I have not seen any bad results from it thus far. I have been in this country only a year and this bean is new to me. I have moved about quite extensively in eastern North Carolina, but have not encountered it except in a part of this county. I am sorry the specimen I am sending does not include any leaves. We have had one light frost which completely denuded the plants of foliage. This bean attains a height of some ten or twelve feet. I am enclosing a photograph showing the leaves.

"If you can give me any information about this bean, either by letter or through the American Journal of Veterinary Medicine, I will appreciate it."

The sesban belongs to the pulse family which contains a number of poisonous plants like the lupine, rattle-box loco weed, etc. It is a tall, smooth, branching annual vine with yellow flowers in axillary or compound racemes. The plant has previously been suspected of being poisonous. This statement is made in my "Manual of Poisonous Plants": "In 1897, Dr. A. P. Anderson sent this to the writer with a letter from some stockman from South Carolina, who stated that it was suspected of poisoning his cattle. Mr. Chestnut records a similar statement."

VETERINARY JURISPRUDENCE

I am in need of a book on veterinary law or veterinary jurisprudence. What can you recommend in that line and what is the price of the book?—W. A. S., Ky.

Reply: The only textbook on veterinary law or veterinary jurisprudence available is Hemenway's "Essentials of Veterinary Law."

carpa) during the fall, with the following let- of the leaves.

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the lasting gratitude of those who are aided by your suggestions.

Tyler Fires Opening Gun in Lively Discussion

Practical Training Counts

IN the admirable little article entitled "More Clinical Training Needed," by Dr. Tyler of California, in the April number of the Journal, a subject of more than passing interest was touched upon. In three short paragraphs Dr. Tyler brought out more real practical ideas than are often found in articles three pages in length. The writer merely wishes to congratulate Dr. Tyler for his timely article, and to add a few ideas of his own.

Middle-aged veterinarians have seen a marvelous change in practice during the past ten years. Those who were in practice twenty or thirty years ago must feel like Rip Van Winkle, as they walk down the modern city streets, or drive along country highways, and see autos skimming around everywhere.

Have the colleges kept up with this transition? Have they emphasized the business side of life? Many professors deem it sacrilegious for a student to even think of how much a stockowner should be charged for a six-mile visit; what an average dental case is worth, or how to extract, painlessly, a ten-spot from a client, and still leave the latter smiling and satisfied.

Impractical materia medica has put many a graduate on the skids, and so badly in debt that he folded his tent at midnight, and silently stole away. The undergraduate is taught to memorize the botanical name or chemical cognomen of a drug; everything but the price! Here is a sample prescription written by a recent graduate for a case of spasmodic colic:

Flext. hyocyamus
Flext. cannabis indica ℥ii
Ol. lini q.s. ad. ℥xvi
M. f. sol.
Sig: Give in two doses, one hour apart.

With hyocyamus and cannabis the price they are, and also linseed, why wouldn't have two ounces ol. terebinth. deodorized with a little eucalyptus aromatic spirits of ammonia in a quart of cheap mineral oil have been just as efficacious? The druggist who compounded the prescription cussed while doing it; the owner nearly died from apoplexy when he paid for it; the horse nearly choked to death getting drenched; and the veterinarian wondered why he never got another call from said client.

One will learn more money-making short-cuts from an up-to-date successful practitioner in two hours than he will from poring over extinct materia medicas and therapeutics written in the days when potassium permanganate was nine cents a pound, and fluid extract of nux six bits a pint.

Why should a rich, tight-wad, pro-German rancher be let off with the same fee as a poor widow with two sons overseas? Why not charge both calls to friend money-grabber and forget the latter? These are little questions of high finance not touched on very heavily at school.

What constitutes ethical advertising? Some of the letterheads that drift into the writer are fearful and wonderful in design. Sky blue or canary yellow in color, the name of the modest veterinarian appears in 36-point old English type, curved gracefully around a horse's head. Business cards in the local newspaper vie in space and heavy type with the auctioneer or real estate agent. Also, the dear newly-fledged veterinarian will learn that a fellow graduate will confer the order of the double-cross just as quick as a horse trader. Very few veterinarians use a typewriter; eighty-seven per cent write an illegible hand, and some of the orthography would grace a comic column. These are small matters, you say, but they add to the prestige or detract from our profession more than we may imagine. All this is learned in the school kept by old Mother Experience, but a few suggestions of the pitfalls along the road would be mighty helpful to the student in after life.

Interstate inspections are lightly touched on in college training. In fact, the price is never

mentioned, as though being too trivial to be thought of. Great stress is laid on the pathological side; how careful the veterinarian should be to take temperatures on the exact dot; how he should talk to a worried emigrant on the beauties of science and the wide-spread dissemination of glanders and tuberculosis; what our government is doing to eradicate these maladies free of charge, and so on, until the emigrant goes to sleep. Does our student get any practical hints on how to load a car with eight head of horses, two cows, household goods and farm implements? Or is he given clinical instruction on physical examinations of horses, cattle, swine or sheep? What is a reasonable fee for an inspection or test? Are the state or Canadian inspection laws explained to him, so that in after life he can tersely and quickly answer questions asked by the prospective shipper or railroad agent? With so much confusion, different fees, and general handling of the situation, it is little wonder this work is slipping away from the practitioner.

Law suits are another phase of the profession lightly stressed on. Until Dr. Hemenway wrote his fine book on "Veterinary Law," the average veterinarian didn't know enough about legal practice to qualify as an expert in a dead cat case. Suppose you are called in a law suit between two good clients, what are you going to do? How can you act so that you can retain the friendship of both parties, provided you are neutral in the matter? By conducting yourself with unaffected, everyday common sense, you will be treated with consideration by the lawyers on both sides. You can answer questions in such a way that neither the judge, lawyers nor clients know what you mean, and get away with it. The pay is good—twenty-five or fifty dollars per day and expenses being paid for expert witnesses; one can get higher fees provided he acts a little coy and doesn't jump at the first offer.

Meeting the public is more or less of a gift. Two classes are found in our profession; the hail-fellow well-met, who bluffs his way for awhile, but never stays long in one place. He is usually well equipped with large lodge pins or a fob about the size of a mule shoe. This gentleman never makes less than three thousand dollars a month, according to his modest statements, and little items like twenty or thirty dollars are too small to think of. He usually lives in a rented house; makes his headquarters at a pool hall, and smokes two-bit cigars, while his wife wonders how they will pay last month's bills. He splurges around, and, like the Light Brigade, is not afraid to charge anything. In a year or so, he changes his location, and his name is regretfully hung on the "gone but not forgotten" list of the local merchants. This gives a new veterinarian a mighty fine foundation to begin on. When you meet a man who has practiced in one location for ten or fifteen years, who owns his home, and whose credit is gilt-edged, take off your hat to him. He may not wear creased trousers all the time; his shirt may have a soft collar; he does not glitter like a sophomore going to an informal dance; he is merely a solid, substantial citizen, who provides a good home for his family, who is a credit to his community, and who is looked upon by his neighbors as a mighty good fellow in his quiet way. You will find him an expert on something, like being a first class surgeon, diagnostician, or delving on some out of the way hobby such as poisonous plants, animal husbandry, or the like. One man cannot be an expert in everything; he must be able to get by with it in general practice, but the main thing is to be able to live so that he can pay more attention to his weak points.

Such topics as restraint of animals; giving medicines; handling refractory clients, and getting reasonable fees have been discussed so many times, a repetition would be tiresome. The average practitioner usually sticks at home too close; he moves along in his little circle of practice from one year's end to another. He does not attend association meetings enough; he neglects to subscribe to periodicals other than veterinary journals, for example, the *Breeder's Gazette* or the *American Sheep Breeder* and other stock papers may be profitably read by every veterinarian.

County agent activities thrive where the local veterinarian is nothing but a horse jockey or narrow minded. Again, he may be a recent graduate, full of scientific theories, debts, and impractical ideas. With nothing but straight practice to live on, he charges excessive fees, and soon peters out. He regards a call as so much cash, and loses sight of the personal interest part of practice. The writer has been called to see a sick cow, and before he got away was asked to look at a lamb undecided whether to live or die, a rabbit with something the matter with its head, and a prize Plymouth Rock rooster full of spring fever and general malaise. Perhaps a good sow was lame in the hindquarters, the collie dog had stepped on a piece of glass, while the cats had the snuffles. A few years of general practice and one soon forgets whether the external iliac artery of a horse empties into the aorta or the Gulf of Mexico. But he learns practical, everyday matters that mean money to his clients and checks for himself.

And the greatest thing that is poked home under his hat is his lack of knowledge. The more he studies and puzzles over questions the less he knows about them. This is what makes the average audience at an association so skeptical of a paper read by a man who has never practiced a day in his life, and who lays down certain theories that always result in certain cures—sometimes! More miraculous recoveries have occurred in the class rooms of our va-

rious colleges than Germans killed in saloons by middle-aged citizens full of patriotism and ginger ale high-balls. The graduate treats a case that corresponds to influenza as found on page 534 of his notes. The pulse, respiration and temperature are carefully taken, and treatment given as recommended. He goes home full of joy at a job well done. He dismisses it from his mind, for will it not get well? "Only 7 cases out of 8,970 at the Buda-Pesth clinic were lost in 1873," and his case is a light one. He meets his client several days later, who greets him with:

"Well, Doc, th' old horse croaked last night!"

Again, a mare has an everted uterus. He tackles it full of vim and enthusiasm. He replaces it, collects a fee and gives a favorable diagnosis. The animal dies getting well, and he wonders why that particular stock owner looks at him queerly.

The old-battle-scarred veterans who have seen twenty or more years of practice are the boys who can render a diagnosis so grave in every simple case, that the client regards them as wizards, for did not "Doc say they wasn't a chanct, but he would do what he could? and by jing, she pulled through. Doc is sure thar when it comes to treatin' stock!" When a young fellow gets old enough so that he can learn something from an old practitioner the first great lesson in life has been learned.

More articles on the practical side of the veterinary profession are what is wanted by the rank and file. Little short-cuts and pitfalls and suggestions that mean less work and more money; more success and fewer fatalities; more meat and less heated carbonic acid gas!

E. T. BAKER.

Moscow, Idaho.

All Not Fitted to Be General Practitioners

I wish to commend Dr. John L. Tyler on the article from his pen appearing on page 194 of the April Journal. Our veterinary literature, including our journals, is today made up largely of what may be literally termed scientific articles, and it is well that it is so because science and scientific principles naturally underly and support all our practical work. It is likewise easier to corellate and prepare for an article, information and data on theories or laboratory results, than it is to put in print a true clinical picture of cases we meet or work we do in general practice. It is not always easy to depict a clinical picture or to procure data with mathematical precision as to a certain case or number of cases, and in the event of death it is sometimes difficult to complete our data by a post-mortem; therefore, articles from practitioners expressing their views, if presented in the same good spirit and even temper that Dr. Tyler has presented his, should be really welcomed by our profession.

I do not look upon Dr. Tyler's article as a criticism, but rather as a bit of advice, and good advice. I also feel that there is a growing tendency with most of our colleges to get more men associated with their institutions who are successful practitioners as well as teachers.

We all realize that strange enough many good practitioners do not care to teach or write and it seems the more practical a man, ofttimes the more he dislikes teaching or writing; however, many a splendid practitioner, after 25 or 30 years of practice is quite content to do a little less hustling and relate to students some valuable information he has gathered.

A practitioner that is fairly well balanced so as not to make exaggerated statements to his class is a far more useful teacher, than the man who fills 95 per cent of his lectures with quotations from textbooks.

I know of some teachers who would probably make light of Dr. Tyler's arguments, in fact I have heard them state that it is an easy matter to acquire practical knowledge after leaving school. This, of course, is ridiculous, as every practical practitioner will agree, and as Dr. Tyler says it is unfair to the student to allow him to leave college intending to go into general practice without having had any experience with a practitioner, because let a man be ever so thoroughly trained in the scientific principles of veterinary medicine, if he shows lack of familiarity with domestic animals when starting for himself in general practice, he will so blight his future that it may lead to utter discouragement. This is not theorizing. We have proof of it in many communities. Two men leaving college at the same time and locating in the same community, one with a fairly good general veterinary training, but considerable aptitude and clinical experience, will bury in obscurity his classmate who could easily be his instructor in chemistry, bacteriology, and pathology, but we must remember that in this particular case are two men from the same school with the same opportunities, but one has taken advantage of the practical side and the other man never should have been a practitioner.

I agree with Dr. Tyler that we should make every effort to give our students all the practical clinical experience possible and that all veterinary schools should steadily increase their facilities to do so, and notwithstanding that I know that a majority of instructors will disagree with me, nevertheless it has always been my custom, and I intend to continue it until it has been proved to my satisfaction that I am in error, to advise my class (senior class) to devote their greatest energies the last year to that particular branch of veterinary medicine to which they are best fitted. Such members of the class as express the intention of going into general practice and seem fitted for it, I encourage. I also encourage them in their spare

moments to get clinical experience, and I make a particular effort to give such men practical work in my subjects. On the other hand, students who would plainly be misfits in practice, I counsel to select some other field. In my judgment it is a mistake to give our student body as a whole the opinion that they can all be *made* practitioners. If they attempt it they will find youth a struggle and old age a regret.

Appreciating the necessity that the majority of our veterinary students should become capable practitioners and that the practitioner occupies the most important post of all branches of veterinary medicine, we should therefore emphasize the great necessity for the practical training of these men; imitate the woman of Canaan and the blind man of Jericho by calling in a "louder and more animated voice."

Goshen, N. Y. J. F. DEVINE.

Field Work Now Included in Veterinary Course.

I have read with much interest the article "More Clinical Training Needed" by Dr. John L. Tyler. The subject discussed is an important one and has been considered by the leading veterinary colleges for several years. As a result, the leading schools now maintain ambulatory clinics (laboratories in medicine or practice). In these clinics all conditions ordinarily met with in practice are handled "in the field under the direction of a finished practitioner." Obviously the extent of such training is somewhat limited as compared with the experience obtained in several years of actual practice. This limitation is unavoidable at present because it is necessary for the colleges to give certain technical training that cannot be secured elsewhere. Clinics are laboratories in surgery and medicine, and the average student cannot expect to become a finished laboratory man in these branches during the average course in college any more than he can expect to develop into a finished pathologist, bacteriologist, anatomist, etc. We should, however, approach as near these ideals as possible, considering the capacity of our students and the ability of the instructors, both of which should show gradual improvement as our standards are raised.

It is asking too much of our veterinary colleges to produce "the experienced horseman and stockman" as well as the well trained veterinarian, considered both from a technical and practical standpoint, from the raw material that has in the past entered our schools. If the veterinary schools are neglecting clinical training and emphasizing something less important then there should be some adjustment.

The plan of specializing during undergraduate work in veterinary colleges has not yet been adopted and until then we must give the best balanced courses, considering all branches of the profession, that can be arranged with the efforts of the faculties and advice of the general practitioners. Dr. Tyler's article contains suggestions and helpful criticisms that should be welcomed by all veterinary colleges.

Ames, Ia. C. H. STANGE.

Dean and Director, Vet. Dept., Iowa State College.

Practical Training in Ambulatory Clinic

I have read with a great deal of interest the article on higher education by Doctor Tyler in the April number of the Journal. I agree fully with him on the points that he emphasizes, but a question has arisen in my mind whether Doctor Tyler is fully familiar with the methods of instruction that have been usually adopted by veterinary faculties. One can readily infer from the article that Doctor Tyler is under the impression that the technical training overshadows the so-called practical phases of the work. In the past this may have been true, and is still true in the cases of those men that wish to specialize in laboratory work. We must bear in mind that there always will be veterinary students that are especially attracted by the laboratory courses and by the immense field open to them along investigational lines. The importance of these fields should not be minimized, because after all the practitioner can accomplish but little if he does not have the backing of the laboratorian, and most veterinary curricula are now so arranged that if a student wishes to specialize in the technical branches, he can do so.

On the other hand, I believe that veterinary faculties are very much alive to the fact that all veterinary education and all of our attempts to prepare a young man for the conservation of live stock, should cause educational matters to be so pointed that the future practitioner can handle matters in the field both to his own credit and to the institution from which he is a graduate. In so far as the writer knows, all veterinary schools have at this time in actual operation or in preparation, very strong courses in clinical instruction. In times past, most of this instruction was given in a college hospital where the student did not have an opportunity to contend with his patients under the conditions that the practitioner is usually compelled to work. The ambulatory clinic overcomes this difficulty in a very great measure. This is especially true when the college is located in a country district. I believe it is quite a universal practice for one or more members of the veterinary faculty to answer calls from the surrounding territory, and they are always accompanied on these calls by several of the students. The practitioner in this case is usually the Professor of Medicine or Surgery, so that the matter as taught in the classroom

can be worked out in its practical details in the field to the full benefit of the students.

Many of our veterinary colleges are connected with agricultural colleges, and the latter maintain large herds of the different breeds of domestic animals. These herds receive unusual care and attention in feeding and handling, and herdsmen insist that veterinary practitioners devote the same care and attention to these animals that their unusual value warrants. The student observes these points and it is very valuable training for him, because there is nothing that the average owner of animals resents more than to have his live stock treated in an unnecessarily harsh or cruel manner.

I am very glad that Doctor Tyler has taken this stand in favor of higher education, because it indicates that the foremost practitioners in the field are now taking that broad view of the situation which is bound to react favorably for veterinary education as a whole. I also appreciate the opportunity presented to discuss the article.

R. R. DYKSTRA,
Professor, Veterinary Science.
Manhattan, Kan.

Some Veterinarians Qualify as Politicians

Having read the article by Dr. John L. Tyler "More Clinical Training Needed," I suspect he did not make a differential diagnosis when referring to "empirics."

There was a time when self-educated veterinarians were not classed as "empirics."

It is a fact that the American Veterinary Medical Association was formerly known as the United States Veterinary Medical Association and that the membership in its early days was largely composed of non-graduates.

Today when a graduate of a veterinary college fails to pass a State Board of Veterinary examiners, he is to all intents an "empiric" should he open an office and solicit patronage.

Let the reader decide the status of the veterinarian when he fails to pass a State Board of Veterinary examiners, and is employed to practice by one of the examiners who refused him a license. Dr. Tyler places "higher education" as the one desirable aim to qualify the graduated veterinarian. No one will take issue with that opinion, for it will qualify the veterinarian to deal with the affairs of conservation, not only as regards commercial interests, but also the health and happiness of mankind.

Some of the more highly educated veterinarians have qualified as politicians and have demonstrated an utter indifference to commercial interests, as well as to the future happiness and producing powers of the human family.

In order to play the game, the qualified political veterinarian will resort to the art of camouflaging, for parasites are not unlike the sphinx.

The power of observation and analogy is essential for a successful practitioner in the field or laboratory.

Dr. E. F. Thayer, a self-educated man, would be an "empiric" of today. He did, however, stamp out the first outbreak of contagious pleuropneumonia in the United States. After graduation, during my last year as assistant house surgeon, I was in his employ for three months.

J. F. WINCHESTER,
Lawrence, Mass.

Still in Reconstruction Period of Profession

I am in full accord with Dr. Tyler's views. We are still in the reconstruction period of our profession in this country. Dean McGilvray has introduced clinical teaching as a new feature for students in the Ontario Veterinary College. The quantity and quality of the teaching is worthy of consideration.

Dean Hoskins is the greatest association worker that our profession has produced in any country and any time, and the same can be said of our Dr. W. L. Williams in surgery and obstetrics and diseases of newborn animals. Who will be brought forward as a great clinical instructor? Surely none of those whom Dr. Hall met at Camp Greenleaf or Camp Lee. The United States may produce him at any time.

Twin calves, male and female, united from the anterior portion of the sternum to the navel. The calves were fully matured and externally all parts were normal in each calf, while the internal organs were single with the exception of the heart, of which there were two. The liver was abnormally large. The mother, a three-year-old and rather small, did not live.
Defiance, Ohio. REX. I. MANN.

I really believe that clinical teaching can be done effectually in general practice connected with ambulatory clinics arranged in various parts of our country, possibly with facilities similar to those established and maintained by our friends in the medical profession.

I have been thinking these years about the feasibility and utility of attempting to establish an ambulatory polytechnic in connection with a large general city and country practice. Would it work? I note Merillat's school was a "water haul."

J. A. WAUGH.

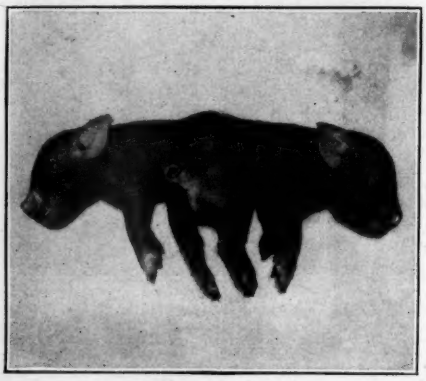
Pittsburgh, Pa.

Takes Little Sense to Criticize

I long ago recognized the fact that it takes less sense to criticize than to do anything else in the world; also that the true critic is one that offers a constructive remedy for conditions complained of. My remedy may not be the right one, but the fact that my criticism strikes a responsive chord is proof to my mind that I have touched upon a live question. While I recognize fully the wisdom and learning of a majority of the school men and the honesty of their opinion and efforts, I am inclined at times to think at times that perhaps they are just a little bit jealous of their prerogatives as teachers and instructors. One thing I am quite sure of, however, is that if my ideas are not correct and adopted there will be some effort made by the colleges to meet the issue and that the schools will inaugurate some system whereby the student will be better equipped to take up the practical side of his life's work and will at least keep him from putting himself in the ludicrous position of trying to straddle the hind leg of a horse to remove a shoe, as I saw a young graduate of one of the noted universities do.

JOHN L. TYLER.

Pomona, Cal.



Rather unusual double pig delivered by Dr. J. O. Young, Topeka, Kan.

Said All There Was To Say

Dr. Tyler in his article on page 194 of the April Journal, has said about all there is to say. He has covered the subject thoroughly.

I do not believe, however, that any veterinary college can give sufficient clinical practice to successfully teach a student from the city how to approach and handle unruly animals. All veterinary students who have not had an opportunity to learn to handle animals on the farm should try to arrange to put in one year after graduation with some practical successful veterinarian. There are a lot of other things besides those mentioned in Dr. Tyler's article that a student could learn with a good preceptor.

D. F. LUCKEY.

Jefferson, Mo.

HOBBLES AND CASTING HARNESS

Relative to the inquiry of J. W. R. on page 134 of the March Journal as to the best hobbles and casting harness, while I am not an authority on these matters, I have used several devices for casting horses. My favorite is the Klotz tackle, but the secret of success with any harness lies in the proper use of it. If the inquirer will write to Dr. Klotz, of Noblesville, Ind., he will receive some useful suggestions as to the use of his hobbles, also the obstetrical shears and saw.

F. R. BARTLOW.

Cumberland, Ind.

PLAN WORKS HARDSHIP ON VETERINARIAN

Your comment on page 125 of the March issue of THE AMERICAN JOURNAL OF VETERINARY MEDICINE interests me. I am glad to note that you admit "accredited tuberculosis free herd work is undeniably an infringement on the field, the rights, privileges and perquisites of the general practitioner." I am disappointed, however, to note that you justify such "infringement" by stating that it "is necessary to popularize bovine tuberculosis control and eradication work," similar to the work done with hog cholera serum a few years ago, and when the stage has been reached where tuberculosis control measures are thoroughly popularized the B. A. I. will withdraw from the field. You have no grounds for thinking that the B. A. I. will withdraw; the Bureau has never made any such statement or if it has I am not aware of it. The accredited herd plan is definitely based upon the provision that the testing be done by federal and state employed veterinarians; it is to be a permanent institution. The only way the matter can be turned over to the practicing veterinarian is to change the canons upon which it is built or drop the plan altogether. I do not think the B. A. I. has any idea of doing either.

We should remember that the main idea

in any plan of tuberculosis control is to find and eliminate cases of tuberculosis. If a tuberculin test applied by an honest, conscientious veterinary practitioner is not acceptable then the only alternative for the practitioner is to assume that the B. A. I. considers all practitioners either incompetent or dishonest. I consider the whole idea, i. e., limiting testing to regularly employed bureau and state veterinarians, an insult to every practicing veterinarian in the country. According to the present plan it makes no difference how honest a test a practitioner has made, the herd cannot be admitted to the accredited list; the natural inference for the owner is that his local veterinarian's test is not as good as the Bureau man's. Possibly, too, because he has charged for his work.

I am enclosing a clipping from the editorial page of the March 6th issue of "The Wisconsin Farmer" that corroborates my statement that "the free part of the arrangement is the biggest drawing card to the whole scheme." You will note too that tests will be made "preferably on herds already known to be clean by local tests made by resident licensed veterinarians." If these herds are "known to be free" why not accredit them without further "red tape?"

If a local veterinarian's test is worth anything at all why not accredit herds on evidence furnished by such test? A test is either wholly good or wholly bad; there is no intermediate grade. The Bureau is making little progress in tuberculosis control by testing such "preferably clean" herds that has not already been made. The Bureau work simply duplicates that of the local veterinarian and duplication is both useless and expensive. Real progress is made when new foci of infection are found by testing herds that were never tested before, the owners of which have thus been converted to the "test booster" class. So far as my observations go, the B. A. I. has tested no herds in Wisconsin that would not have been tested by local veterinarians.

My idea of an accredited herd plan is to recognize tests made by local veterinarians, have federal men apply check tests from time to time, and if it can be shown without shadow of a doubt that a herd of cattle already accredited is badly tuberculous put both the owner and veterinarian off the list. Give the practitioner a "boost" rather than a "black eye."

The practitioner is unfortunate in that he has no properly directed plan of publicity. The B. A. I. has its many bulletins, the farmer his agricultural press, while the practitioner has nothing at all. Our national association does very little to help his cause; our United States Association of Live Stock Sanitary Boards is largely dominated by laymen and state and government veterinary officials who seldom intimate that local veterinary service is of any consequence.

The practice of veterinary medicine is not a charitable institution; we are practicing for profit, so are the men in the employ of the B. A. I.; they have sold their services for a stated fixed sum. I notice, frequently, how quickly B. A. I. officials give up their work of high ideals "to preserve, protect and perpetuate a greater and grander live stock industry" for more lucrative commercial positions. Let us not "kid" ourselves that we are philanthropists; we haven't the means to found public libraries, etc.; we are all working for profit and justly so. I practice in a section where considerable accredited herd work has been done and am familiar with how the plan works out in practice. Owners of accredited herds are beginning to see where their local veterinarian's service in testing is of value to them. Human nature is such that it never misses a thing until it tries to do without it. Our accredited herd testing is often an inconvenience in commercial transactions. To become popular the B. A. I. must offer the same services. The local veterinarian has a place to fill in this work, namely, tuberculin testing, so why not leave him to his field unmolested?

Waukesha, Wis. HERBERT LOTHE.

FROM ANOTHER VIEWPOINT

Dr. Lothe, in his comment on the Federal Bureau of Animal Industry, in the March number of the Journal, doesn't seem to start from the proper angle, as I view it.

The public demands better milk as a needful food.

The dairy association tilts the price.

The government starts after the tubercular cow, and the dairy man files a protest and bases it on the added cost for inspection and sanitation, and boosts the price again.

The public reads lengthy articles in the newspapers about the "Dorseys" and other of their ilk, and wonders what local veterinarians are doing to remove danger of contamination to their children; what, in short, are the steps being taken to safeguard the little ones against infection through this now altitudinously priced food.

You know Dr. Tyler of Illinois is "not the only one"—far from it. Every community has its own Dr. Tyler, and the public sometimes loses faith in the services of the local veterinarian who may be protecting his own pocket in the first instance, and enforcing the provisions of federal law in the second.

Far back in the early days of public protection—back in 1882, as I recall it—Dr. Frank Billings was soundly ridiculed by the Bureau of Animal Industry for vaccinating pigs

against hog cholera. That was at the Nebraska State Agricultural Station. Can any statistician figure the hundreds of millions of dollars saved to the people of this land through a continuance of the practice which brought Dr. Billings an avalanche of scornful laughter? Were that pioneer practitioner alive today he would receive honor and commendation instead of scorn and condemnation.

The Bureau of Animal Industry finally followed. It put the practice in vogue. By so doing it made it possible for the local man to earn generous fees, provided of course such local man will do his work as he knows it should be done.

But there are "Dr. Tylers" in plenty doing hog work today.

In my opinion, the farmer is not only well within his rights, but he is wise in looking directly to the Bureau of Animal Industry for proper work; right in demanding of the Bureau the selection of proper men, capable and anxious to do their work intelligently, fearlessly and with but one end in view—the protection of the public. In a generality of cases the government inspector is a stranger in the community. He has no favors to repay; no grudges to square; no fear of lost patronage; no hope of reward through the rendering of favors to the politically powerful. Incidentally, if he is fit for his appointment, he will insist upon a close adherence to the law, because he knows that benefits will follow and he cannot but wish to show to the farmer that science sometimes steps far in advance of old-fashioned practicality. In fact, the farmer's scorn of the scientist has cost him millions. After one or two demonstrations he is content to summon knowledge when his stock is threatened.

Every honest veterinarian should start "hot foot" on the trail of every Dr. Tyler. There shouldn't be a "peaceful sector" in the land for one of them. The veterinarian who fails to play honestly with the public and who leans, ever so slightly, to a breeder of unhealthy cattle, has obtained his certificate under false promises. It was given to him on the theory that he was an honest man.

Today, the major portion of the public puts trust in the Bureau of Animal Industry. The belief is constantly growing that this Bureau is striving to do much good and to undo much wrong. The man from the Bureau devotes to his task all of his time and all of his knowledge. He doesn't curry favor with a rascally breeder or with a man who knowingly maintains an infected herd in the hope of gaining a fat fee because he is working for all and his fee comes from the nation.

All B. A. I. men are not snow white, neither are all Y. M. C. A. men, nor all Salvation Army men, nor all bankers or brokers nor veterinarians. Every vocation can produce its quota of "misfits" and black sheep, but the percentage of bad ones is pleasingly low.

So hats off to the good ones; a toast to the veterinarian who halts the crooked stock man and a bow to the editors of all veterinary journals that tell the truth.

F. A. CRANDALL.
Buffalo, N. Y. Zoological Park.

FORAGE POISONING IN HORSES*

In presenting this paper, I claim nothing original, but shall group together a few conditions with more or less similar symptoms, some of which have received special names based upon symptoms or pathological conditions, but some of these conditions present so complex a lot of symptoms and pathological lesions as to make it next to impossible to call them anything but forage poisoning.

Typical cases that come under this head are poisoning from moldy silage, moldy corn or other moldy food, food containing acrid fungi and food containing poison of a chemical character.

Nearly all cases in which disturbances of the central nervous system, or of the regional nerves, is the first and most prominent symptom, are cases of forage poisoning. Some of them show cerebral and spinal symptoms first and regional nerve symptoms second, and vice versa.

Some develop pathological lesions in the course of two or three days and die in three to ten days, others hang on, gradually growing worse, for two or three weeks, and others, the more acute ones, die in a few hours.

The disease known as epizootic or enzootic cerebrospinal meningitis, or by any of the other many names for this disease, belongs to the former class, and silage poisoning and poisoning due to chemical causes belongs to the second.

The more acute cases are seen in the cornstalk disease and cotton-seed meal poisoning, and cases arising from overfeeding with too highly nitrogenized food, death from these latter causes often occurring in a few hours.

Cases due to fungi or acrid substances in the food, either dry or pasturage, cause stomatitis, gastro-intestinal inflammation and dermatitis, coronitis and sometimes laminitis.

I do not include in forage poisoning the cases due to specific and well known poisonous plants, such as poisoning from hemlock, loco, larkspur, lupines, etc., but I include all cases of poisoning in which the poison is in the fodder and not known to be due to some specific element. On account of our ignorance of the specific poison that causes the deaths we are inclined to group all such cases under the generic name of forage poisoning.

Moldy silage produces progressive paresis,

*Presented at the Illinois V. M. A., Chi., Dec., 1918.

beginning in the pharynx and extending to the cord and finally to the brain. The affected animals wabble on the second day, and usually go down and are unable to rise on the third, and die on the fourth or fifth day. Dr. Robt. Graham says the specific poison in moldy silage is the bacillus botulinus, at least he has found that bacillus in cases he has investigated.

The symptoms, course and termination of corn stalk disease are too well known to require description here. In its nature it is an auto-intoxication. The toxin is generated in the stomach. This toxin has not been isolated, nor can its formation in some seasons and in some fields be accounted for, while in other seasons and fields it fails to develop.

Cotton-seed meal and other highly nitrogenized food poisoning is probably purely dietetic; some toxin develops that poisons the nervous system and produces paralysis of the brain and death in a few hours. These foods are harmless when properly diluted with some roughage.

Cerebrospinal meningitis is the most common form of forage poisoning. It occurs more frequently and is more widely distributed than any other. In fact it may occur anywhere when conditions are favorable. The conditions existing in the most notable epizootic cases have been a dry season followed by a wet, hot spell, causing mold to form on the grass and other forage. This mold caused considerable trouble in Kansas and Nebraska and adjoining states a few years ago, and accounted for the cases occurring in horses at pasture, while other horses fed on previously cured hay escaped it. Colder weather and lessened humidity, especially frost, caused a subsidence of the disease. This mold exposed to the sun for two or three days in dry weather was soon robbed of its poison. I believe isolated cases of cerebrospinal meningitis have been caused by insufficient ventilation. I have known cases to occur in cold weather when the horses had been fed on dry feed, but on account of extremely cold weather the windows were closed and the disease in a mild form developed, but usually yielded to rational treatment.

Treatment of forage poisoning is practically limited to removal of the cause. This can be done only by a complete change of food, which is, at times, very difficult to do, and is often attended by considerable loss. In the city we sometimes are obliged to condemn oats or hay by the car load. In the country it is necessary to suspend the use of a pasture, or cornfield, or moldy silage—corn, oats or hay. It is often very difficult to determine what food contains the poison, hence it is necessary to investigate and experiment to a considerable extent before we undertake to condemn any of the feed. On general principles it is unsafe to feed moldy forage of any kind to horses, for they seem to be more susceptible to the poison of molds and fungi than other genera.

Medicinal treatment is almost useless in these cases. A liberal oleaginous purge at the very onset of the attack will sometimes abort it, but after paresis is well started nothing will stop it. During convalescence from mild attacks nux vomica and arsenic are indicated.

A. H. Baker.

Chicago, Ill.

ARE HOG CHARACTERISTICS TRANSMITTED IN SERUM?

I wish to know if the serum taken from a certain hog will transmit the characteristics of that hog to an entirely different type of a hog into which it is injected. Or, to be more explicit, will serum taken from an Arkansas range hog which is a "regular wind-splitter, razor-backed, fiddle-faced hog," if injected into a pure-bred hog transmit the characteristics of said hog to the pure-bred hog?

I know of a serum company that makes a specialty of buying these range hogs for use in its serum manufacture. In May, 1917, I secured some of their serum and vaccinated a pure-bred herd of Jersey Reds, and the owner has "cussed" me ever since, claiming that the hogs did no good after they were vaccinated; said they would not grow or fatten, and were as wild as range hogs.

In October, 1918, I had an opportunity to try it again on some shoats of my own. I had two Poland China sows that each gave birth to five pigs. When the shoats were three month old, I ordered some serum from the same company, knowing that they had recently purchased two or three car loads of these range hogs. I also bought some serum from another serum company located where it would be practically impossible to secure range hogs.

I vaccinated one bunch of five pigs with one lot of serum and the other bunch of five pigs with the other serum. The two bunches of pigs have run together and drank out of the same trough, eaten the same food, and slept in the same quarters ever since. Yesterday I sold part of them, and those vaccinated with the serum from the company that uses range hogs were not half as large as the other five and were as wild as deers. All these pigs were by the same boar, a pure-bred Poland China.

I know of no reason for this difference, except the difference in the serum. I would like to know if any one else has tried it out.

In 1869, I heard Col. Lou Dorsey, of Louisiana, tell my father that a mare that had given birth to a mule colt would not transmit enough speed to her progeny for three or four generations to make race horses. Again in 1895 this question was pretty generally discussed by such men as Col. Lance of New London, Mo.,

Col. W. A. Hatch and W. F. Cline of Rensselaer, Ind., Wm. Frickay of Huntington, Ind., and I believe they all agreed that Col. Dorsey was right. I, myself, never knew a fast race horse that was the progeny of a mare that had given birth to a mule the year previous, although while I had charge of the Glennevil stock farm I tried it out on two or three mares that had raised some fairly fast colts, as Martin Kelly, by Sterling, son of Almont; May Lewis, out of Matty Kelly and by Valcour, by King Reeny; also Blue Bull, and in neither instance could the colt trot fast enough to get hot. I have wondered if these characteristics are transmitted by the horse, why not with a hog?

I know I have stirred up a hornet's nest, but don't care if I can learn something. As some one has said: "Who so loveth instruction, loveth knowledge, but he that hateth reproof is brutish."

Beebe, Ark. THOMAS CANNON.

Feeds and Feeding*

By W. G. KEEHN, Chicago

DURING the period of the war we were constantly reminded from various sources of the necessity of conserving and of substituting foods that our soldiers and our allies be properly provided for. Only recently were we again reminded by the food administrator that it was necessary for us to save at least two-thirds more food than we did during the past year. This conservation and substitution is just as important in this reconstruction period and in time of peace as it is in time of war. This does not mean that the human family alone should conserve and use substitute foods, but the feeding of the lower animals also should be conducted to this end.

This can be accomplished only if we as veterinarians can intelligently educate our clients and stock owners to feed their animals in a scientific and economical manner so that no food is wasted.

In Europe the veterinarian is called on to advise along the lines of feeding and his suggestions are carried out because he is considered an authority on the subject.

Is this true in this country? Our answer must be, no.

In considering the magnitude of the horse and mule industry in the United States, we find the census in 1911 as follows: 23,015,902 horses; 4,480,140 mules and 122,200 asses and burrows, valued at $3,000,000,000.00.

This industry increased 11.6 per cent for the decade ending 1910. The valuation exceeded that of all other animals.

The census in 1915 was as follows: 20,962,000 horses and 4,449,000 mules valued at $2,842,655,000.00.

It is estimated that the annual expenditure for feed was nearly $2,000,000,000. A more recent estimation is to the effect that there is annually 40,000,000 cultivated acres utilized in the production of food for these animals. This acreage is sufficient to supply an army of 2,000,000 men with food. If only 10 per cent of this acreage could be saved it would mean an annual saving of 4,000,000 acres, or sufficient to supply an additional 200,000 men.

In spite of the enormous feed bill and acreage utilized, less attention is given to the scientific and economical feeding of this class of live stock than to any other class.

Many a farmer will carefully determine which of the available feeds will furnish a well-balanced ration most cheaply for his dairy herd, yet forget that similar principles apply to feeding his work animals.

Henry shows us how it is often possible through the economical and proper selection of feeds and their rational administration to save from 10 to 40 per cent of the usual feed bill, with no injury, and in most cases even a benefit to the animals. It is, therefore, evident that careful consideration of the principles governing the feeding of these animals will pay every owner in dollars and cents. If we could save 40 per cent of the estimated 40,000,000 acres which are utilized it would amount to a saving of 16,000,000 acres or sufficient to supply an army of 800,000 men.

Care Necessary to Greatest Efficiency

It is just as essential to care for work animals to insure their efficiency as it is to lubricate carefully the machinery they draw.

The subject is so great, time will not permit a detailed discussion, therefore I will attempt only to bring out some of the more important phases.

Most of the discussions treat of the horse, since over 80 per cent of our work animals are horses and nearly all of the scientific experiments or trials have been conducted with them.

However, the same feeds, principles of feeding and care applies equally well to mules.

We usually find the ration of the horse restricted to one or two kinds of grain and the same number of roughages. The ration varies with the different locations. In northern sections it is usually confined to oats or corn and timothy hay. In the south, corn is the principal concentrate, with dried corn leaves and legume hay as roughages, and black-strap mo-

*Read at Illinois V. M. A. Meeting, Chi., Dec., 1918.

lasses is a source of energy in sections where sugar cane is grown. On the western coast, barley is the chief concentrate, with roughage from the cereals.

In Europe various oil cakes and beans often form part of the concentrates. In some countries the leaves of the bamboo replace ordinary grass and hay. In some sections of Europe the leaves of limes, grape vines and other plants are employed in addition to the grasses. It is stated that in France a certain sea weed is being fed as a substitute for hay and that it apparently is a cure for lymphangitis. In some sterile countries, horses are forced to exist on dried fish.

These are merely some of the various foods employed in nourishing horses and mules, therefore let us consider the foods most frequently utilized and some of their cheaper substitutes.

There is no grain so relished by all classes and ages of horses nor so prized by the horse owner as oats. Oats are the safest of all feeds, because of the hull not enough can be eaten at one time to cause serious trouble from gorging and there is less tendency for this grain to pack in the horse's stomach as does corn.

Because of their universal favor and the wide demand for them, they are rarely an economical grain. Other single grains or mixtures of concentrates may be substituted for oats without injury to condition, wind, endurance and spirit of animals. The Arab steed so renowned for mettle and endurance is fed no oats, but chiefly barley. Lavalard, the great French authority on nutrition of the horse, after experimenting thirty-five years, concluded that substituting other feeds for oats not only effected a great saving, but did not affect the productive power of the horses in the slightest.

The success attained with a mixture containing no oats, properly balanced in nutrients, having the requisite bulk, shows that in making up the ration for the horse as with other animals, the prices of available feeds should be considered. Henry gives a detailed discussion of the many grains and their by-products which may be successfully substituted for oats or corn as a feed for the horse.

The saving made by the use of cheap roughages as corn stover and straw in place of a large part of timothy hay, and substitutes for oats is illustrated in trials conducted by Norton at the Michigan Station in which two lots of six horses each, doing moderate work, were fed the following rations for ten weeks in winter. Lot 1 was fed timothy hay and oats, with a feed of bran once a week. Lot 2 received shredded corn stover and oat straw as a substitute for a large part of timothy hay, roots, ear corn and equal parts of bran, dried beet pulp and linseed oil cake for most of the oats. During the trial the ration for Lot 1 cost 29.6c per head per day and each lost an average of 11 pounds in weight. The ration for Lot 2 was cheaper and well balanced, costing 17.7c per head per day, and the animals gained 14 pounds each during the trial. The saving was 11.9 cents per head per day. Therefore, if we can save 11c per animal each day, we find the daily saving represents $2,808,652.00 for the 25,533,200 horses, mules and asses.

Other Equally Important Factors

The economical selection and administration of food are not the only factors influencing the efficiency of the horse, but such factors as watering, exercise, housing, grooming, care of teeth, etc., all are of the utmost importance.

Some authorities advise watering horses before giving grain to prevent flushing the grain out of the stomach into the small intestines. Tangl found horses may be watered before, after, or during meals without interfering with digestion or absorption. A horse having undergone severe exertion or long deprived of water, should be watered before feeding. Tangl shows the only important point in the whole matter is to adopt a reasonable and convenient system and adhere to it. A horse should not be allowed to gorge himself when very warm, but will be refreshed if given a moderate drink slowly.

It is absolutely necessary to reduce the feed as soon as hard labor ceases and constant and vigorous exercise is over. If the roughage is of good quality the grain ration for the idle horse can be limited to less than half of that given while at work.

Proper ventilation is important to the health of the animal. Cool, well ventilated quarters with plenty of light are preferable to dark, warm, close stables. In all cases, animals should be kept out of drafts.

Thorough and careful grooming is necessary to remove body waste and dirt, keep the various pores open and thereby keep the skin healthy.

As the horse masticates or grinds his food with his teeth, they should be examined frequently, as they may wear irregularly and leave sharp points or ragged edges which cause pain and prevent proper mastication of the food, hence waste results.

If the foregoing is taken into consideration, the saving of food will not only be accomplished, but the usefulness and efficiency will be increased of the proudest and grandest machine man has, the Horse.

Discussion

Dr. A. T. Kinsley: Many seem not to be interested in this very important topic. I believe you will find in practice, that this is one of the most essential subjects that confront the rural practitioner. It has been found in the past to be a common thing, for a city practitioner to put in all night on cases of colic, but he does not get as many calls for colic

now as he used to because the barn men and owners know more about feeding their animals, but he has calls for other services, and his advice regarding the feeding of animals does not necessarily have to be given gratis, but can be charged for the same as for other services. By a careful investigation you may eliminate the cause of the condition that is on certain premises and make another good client. The truth is most parasitic diseases can be traced to the feed, and their cure will result in a great many cases by correcting the feeding of the animals.

DR. NESBITT: In the years gone by, I would not allow a horse belonging to me to be watered after feeding. I have advised clients of mine to follow about the same method I have followed, even in the working season, to water the horse before, and not after feeding. My advice was followed and I rarely had a call to treat cases of indigestion, especially in the warm weather when indigestion frequently results from drinking water while heated.

DR. MILLS: While in individual cases, it is true some horses will not stand water after feeding, in my opinion, the regularity has more to do with it than anything else. If you start out with one method, keep it up. I have been reading considerable regarding the drinking of water after meals and several authors contend that the food is thus washed from the stomach into the bowel without proper mixture with the gastric juices, but I never believed that. But several articles noted in the past year seemed to indicate that drinking immediately after a meal heavily of water, starts the flow of acid secretions, and this might explain the colic of horses, especially if the horses were not watered before the meal so that they would drink greedily immediately after.

While I appreciate the value of feed in keeping animals in a fit condition and the warning that Dr. Keehn gives us, yet we find in many instances that when we advise the farmer to change the feed, that he just has about one feed and he will protest—say that he doesn't propose to go to town and buy other feed.

He would tell you, he was feeding it, his father always fed it, his grandfather fed it, and he proposed to keep right on feeding it.

Dr. Mills: We have been instructed, especially in college and in veterinary journals, to regulate the bowels with bran mashes. I think we were told that during this meeting, yet one finds many horses that have not been educated to that form of mash. In a rural community, on the farm, you pretty nearly insult a horse by giving it to him and he will go without feed for several days before he will take the mash.

Although I am just a veterinarian's wife, I enjoy reading your Journal very much and wish you the best of success with it.—C. B. L., N. Y.

TESTING BLACKLEG PRODUCTS FOR POTENCY*

The speakers, Drs. T. P. Haslam and J. W. Lumb, pointed out that there is no standard method of testing blackleg products in general use, hence the expressions "Stands the virus test" and "Tested for potency," mean nothing unless accompanied by a statement of the number of lethal doses of virus, against which a certain amount of the product will immunize a certain per cent of the experimental animals.

According to the authors the natural aggressin may be tested for potency in the following manner. At least 20 guinea pigs are given subcutaneously twice the amount of aggressin to be used for immunizing a calf. After ten days the guinea pigs are inoculated with five times the minimum lethal dose of pure culture blackleg virus. It is expected that a good aggressin will immunize 50 to 90 per cent of the guinea pigs, although variation in the virulence and strain of virus will somewhat modify the exact per cent. A pure culture virus killing 90 to 100 per cent of check guinea pigs in 0.1-cc. doses is satisfactory for use in potency testing. It is essential to use a virus of known potency and at least twenty guinea pigs. Routine tests for potency were carried out as above described with natural aggressin (germ-free blackleg vaccine) on 1,068 guinea pigs. Out of the 1,068 guinea pigs treated with two doses (calf size) of germ-free blackleg vaccine and ten days later tested against 0.5 cc., or five lethal doses of pure culture blackleg virus, 894 lived and 174 died. The immunization was 83.5 per cent.

The authors' researches with the cultural filtrate were prompted because Dr. Nitta of Tokio University, Japan, published a report in which he stated that the filtrate of old blackleg cultures seemed to possess about the same immunizing properties as the filtered natural aggressin. Dr. Nitta established that

Showing results of two doses of artificial filtrate tested against five lethal doses of virus. All of the 20 guinea pigs used in the test died.

*Abstract of discussion at Missouri Valley Medical Association meeting.

both the cultural filtrate and the natural aggressin possessed immunizing properties, but he did not carry out parallel tests with the two, hence did not establish that their immunizing properties were identical.

It is obvious that if the cultural filtrate and the natural aggressin possess the same immunizing properties, they should be able to pass the same potency test. Blackleg filtrates were prepared according to the Japanese method, and other methods, and blackleg filtrates made in this country according to the Japanese method were purchased. About four hundred guinea pigs were used in testing cultural filtrates. Potency tests were much the same, whatever the source of preparation of the filtrate. The virus used was a strain obtained from the B. A. I. and was not homologous to any of the products, natural aggressin or cultural filtrates, so far as known. None of the filtrates so far tested will pass the test as outlined for natural aggressin.

The results of a typical experiment are shown in the accompanying illustrations. In this experiment guinea pigs were given one treatment of two doses of artificial filtrate and natural aggressin, respectively, and ten days later were tested for immunity against five lethal doses of virus. As shown in the picture, the filtrate absolutely failed to immunize the guinea pigs against this dose of virus, while the natural aggressin gave a fair protection. The virus was very virulent, 0.1 cc. killing 17 out of 18 check pigs. If the natural and artificial products possess the same immunizing properties they should, of course, be able to pass the same potency test. The total failure of the filtrate to pass this test is evidence of a fundamental difference between the natural and artificial products.

In addition to experiments in which immunity was tested against five lethal doses of virus, three experiments were made in which the immunizing properties of small, medium, and large doses of each product were tested against one lethal dose of virus. The abridged data is presented in tabular form.

ARTIFICIAL FILTRATE

Dose Filtrate	No. g. p.	Dose Virus	No. Died	Percent Immune
0.1, 0.4 and 0.6	22	0.1	18	18.1
1	21	0.1	12	42.9
2	20	0.1	13	35.0

NATURAL AGGRESSIN

Dose Aggressin	No. g. p.	Dose Virus	No. Died	Percent Immune
0.1, 0.4 and 0.6	22	0.1	15	31.8
1	22	0.1	8	63.6
2	23	0.1	5	78.3

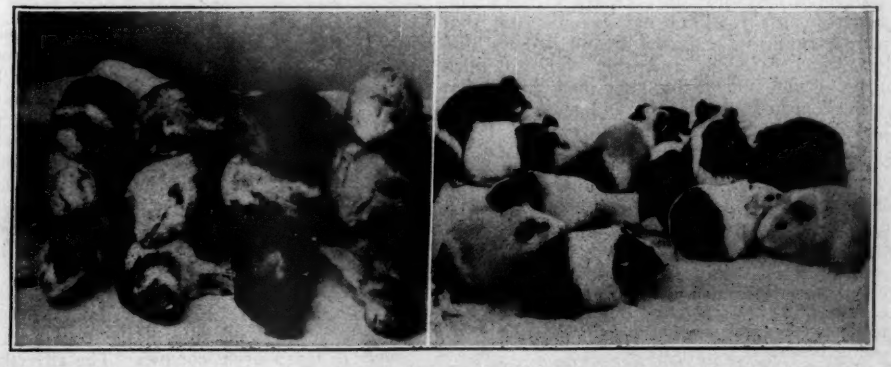
The table shows that the filtrate did not have the same properties as the natural product in any test. In general the natural product possessed twice the immunizing properties of the artificial filtrate. Especially interesting is the fact that the larger the dose of natural aggressin the greater was the immunity of the guinea pigs, but the largest doses of the filtrate did not give as much immunity as the medium-sized doses.

The failure of the large doses of artificial filtrate to produce an increased immunity is well shown by the decided breaks in the curve for the filtrate as compared with the steady ascent of the curve for the natural aggressin.

MILK FEVER THREE MONTHS AFTER CALVING

Recently I was called to see a 12-year-old Jersey cow, which the owner stated had not been just right the evening before, and was unable to get up. Upon examination I found her lying on her sternum, head around to the flank, unable to get up. At times she would raise her head, but could not hold it straight. Respiration deep; mucous membrane pale; temperature 98°; milk very scant.

I inflated her udder and told the owner I would stop on my return from attending an obstetric case. On my return I found her lying down, but she had been up and grazing quite a bit as she was chewing her cud.



Showing effects of two doses of natural aggressin (germ-free blackleg vaccine) tested against five lethal doses of virus. Of twenty-three guinea pigs used in the test, 12 died and 11 lived.

The unusual part of the incident was that the patient's calf was over three months old.

Olney, Tex. R. W. RUTHERFORD.

MICROSCOPIC EXAMINATION NECESSARY IN THE DIAGNOSIS OF ANTHRAX*

I used to think that I could diagnose anthrax accurately by post-mortem examination, but after several years' experience with it in Cuba, I am of the opinion that any one who can diagnose anthrax without a microscopic examination is a wonder. Some cases cannot be diagnosed except by microscopic examination.

Another thing that I think should be brought out in connection with hemorrhagic septicemia, is that conditions that lower the vitality of the animal play a very important part, in my judgment, in the development of the disease. Inclement weather, shipping, driving, and lack of proper care should always be considered as factors in this disease. Years ago in Kansas. I worked on the disease extensively, and I have no doubt I made many errors in diagnose. I was rather careful in making conclusions, but I know that many times in the early 90's I erred in calling hemorrhagic septicemia, corn-stalk disease, but we have a tendency to go to extremes sometimes in professional matters. Dr. Kinsley implies the same in connection with hog cholera. Four or five years ago, here at the association meeting, a man would have been ostracized if he had suggested that hogs had any other disease than hog cholera due to filtrable virus. Now it is generally admitted that they have other diseases, and I think the same thing applies to a less extent, to hemorrhagic septicemia. We are, in my judgment, going to extremes in hemorrhagic septicemia; it is not a very important disease. I am thoroughly convinced that a great many of the cattle dying from the so-called corn-stalk disease really have acute indigestion without the presence of toxic elements in the food. I have seen cattle that were running in stalk fields, and had nothing but the corn fodder, and when they got filled up good and full on that they died, from what we call corn-stalk disease, and many of them had symptoms of cerebral involvement.

Chicago. N. S. MAYO.

ARBUTIN

A glucoside from the leaves of Arctostaphylos uva-ursi (bear berry) and other plants of the Ericaceae.

Arbutin is a stimulating diuretic with decided antiseptic properties due to its partial elimination as free hydrochinone. It is a tonic to the mucosa of the urinary tract without debilitating after-effects.

Because of its cost, this glucoside will possibly never be popular for treating horses, but in canine practice it has been found decidedly of value. In cases of canine cystitis, the result of cold or following overdistention of the bladder in house dogs; or the irritation following the removal of gravel, arbutin is indicated as the remedy of choice. The one-sixth grain dose, with the addition of one-five-hundredth grain atropin sulphate, when given every two hours will prove efficacious.

Arbutin should always be given in solution by the mouth and the free use of water encouraged.

*Portion of discussion all Illinois V. M. A. meeting.

GET ACQUAINTED WITH YOUR COUNTY AGENT

I am well informed as to the feeling of most veterinarians toward the county agent, and after all is said and done, I sincerely believe that not all the fault rests with the county agent, nor yet with the veterinarian. In my own mind I am convinced that almost all the friction between the two parties is due to the misunderstandings between them.

In March, 1916, I made a trip to Fremont, Ohio, with the purpose of looking the place over, with a view of locating there. In the very heart of that little city I saw a sign that projected from a second story window, and on it these words, "County Agent." I at once went to his office and stated my business to him, and asked him what he thought of my locating there. He had been located there but a short while himself, but assured me that from his then small acquaintance with the farmers, that he thought it would be a good location.

I decided to locate there and rented an office room next to the county agent, with a door between the offices, and, let me tell you that the door was always open, unless there happened to be a personal discussion going on. This was an ideal location for a veterinarian, for the best farmers and breeders in the county came to see the agent about agricultural matters, and I had an opportunity of making a large acquaintance.

During the winter months we made as many as three or four trips weekly to various country schools where the agent gave talks or lectures on topics of interest to the farmers of the community. I was always a member of this party when I could spare the time, and was always introduced to those present and given an opportunity of making an address on some live subject of interest. Often farmers had questions to ask on matters that they needed enlightenment on, and I always tried to help them out.

Due to the acquaintances thus formed I was invited to make from one to three addresses at each farmers' institute in the county and a couple in neighboring counties. The advertising that I secured in this manner was of more value than any that I might have secured by other methods.

While the county agent there did not solicit business for me, he never failed to recommend me, when he could do so without making it a personal matter between myself and any other veterinarian in the neighborhood. I admit that I had the advantage over the other veterinarians, simply because I was in the same office with the agent and because I took an active part in his work in the rural districts.

A few months after locating there I was elected secretary of the association employing the agent, and this gave me still more opportunities to get acquainted in the county. At no time, however, was it ever intimated or expected of the members of the association that they should employ me as their veterinarian. In fact many of them had a nearby veterinarian who did what veterinary work they had, and I think this was proper.

The county agent works with just the class of men the veterinarian wants for his clients; the best progressive farmers in the community. Why then shouldn't the veterinarian and agent cooperate? It would be to the mutual advantage of both. I have known several county agents and I am positive that the number of them that are really desirous of trespassing on the work of the veterinarian is very small indeed, no doubt less than 10 per cent, and this could be reduced very much by the veterinarian getting acquainted with the county agent in his locality. A few will be found that are a great detriment and hindrance to the veterinarian, and these should be dismissed from service, but is it right to condemn all of them for the errors of a few? I leave it to you.

If you have a county agent and are not on friendly terms with him, I would advise you to get acquainted with him, and if you can do so conveniently attend some institutes or meetings with him. I am sure that it will be to the mutual advantage of both.

I could enlarge upon the ways in which the veterinarian and county agent can work to the advantage of both, but space forbids. If you have not already done so, let me suggest that you "get acquainted with your county agent; you might like him."

Camp Taylor, Ky. LIEUT. G. H. CONN.

FOOD CONSERVATION.

This Boston bull bitch, belonging to Mr. L. P. Herald, Lebanon, O., evidently believes in food conservation, for after losing her puppies, she adopted three Duroc pigs, and nursed them as shown in the picture.

Lebanon, O. J. W. Bratten.

SANITARY MEASURES IN HOG CHOLERA

Too frequently the term sanitation is translated into spray pumps and disinfectants. Surely these accesssories are, at times, indicated and, if properly used, will yield splendid results in barn, hog house, feed and water trough disinfection; but, unfortunately, many people disinfect like some folks sweep the floors—out of sight, out of mind. Unless thoroughly applied, disinfectants are of little value in the control of cholera.

Of even greater importance than disinfectants are proper drainage of fields, lots and pastures. The hog wallow is an ideal incubator for every curse swine is heir to. The value of frequent change of pasture cannot be overestimated.

Proper ventilation of hog houses is as essential as disinfection.

Sunlight is the natural, most effective and least expensive enemy of pathogenic bacteria, but sunlight must not be expected to penetrate through boards, layers of dust, manure or old straw piles. Farm disinfection calls for shovels, hoes, wagons and manure spreaders. Litter that can't be spread thin over fields and thus exposed to the action of the sun, should be burned.

No fixed formulas can be laid down for farm disinfection. Each premise presents its own problem and must be dealt with according to circumstances. Applications of air-slacked lime are probably of less value than generally believed.

Almost from the beginning of serum-simultaneous treatment, virus has been recognized as a vital factor in hog cholera control. Unfortunately, the popularity of the treatment outgrew the official machinery for its safe distribution. In our eagerness to extend the benefits of this discovery there were those who considered the serum-simultaneous treatment so safe and simple that they believed they could make an efficient and safe serum-simultaneous operator out of any burr-headed nigger in thirty minutes. The plan was tried in one state [Tennessee] but led to a change in administration.

Repeated and emphatic statements of officials from many states, all of which emphasize the great danger incurred in virus distribution, are found in reports of the U. S. Live Stock Sanitary Association. If such expressions are exaggerated or untrue, we should

disclaim endorsement of such law; if, however, such statements are recognized facts, then we should, by emphatic and unequivocal resolution, condemn the present practice of virus distribution.

We feel that the proper party to be entrusted with the distribution of virus within a state is the official who by law is placed in charge of live stock sanitary control in each state.

Federal regulations should prohibit interstate distribution of virus except to or upon order of state live stock sanitary officials.

Though a majority of states prescribe some more or less drastic forms of quarantine restrictions, it appears that legal machinery for enforcing such quarantines are either absent, insufficient or poorly enforced. It occurs to this committee that probably the last named factor is the most important. We fully recognize the overwhelming influence of public interest and public opinion in all matters of this nature and we also believe that possibly live stock sanitary officials have not fully availed themselves of every opportunity to inform the public on such matters and thus stimulate them to co-operation on the basis of community and self interest.

Successful quarantine is possible only when endorsed by public opinion and backed by public approval; or it may be enforced at great expense and unlimited protest, by police control.

Atlanta, Ga. A. L. HIRLEMAN.

MEMBRANOUS LARYNGITIS IN SWINE DUE TO BARLEY AWLS

On page 85 of the February issue of the Journal under the heading "A Case For Laboratory Diagnosis", I noted an inquiry signed "S. C. P.—Ind." relative to a condition found in hogs and characterized chiefly by the formation of a membrane in the upper part of the trachea.

I have encountered a few such conditions, and while I do not doubt that the membrane formed is largely the result of bacterial activity, the primary invader, to my mind, is of a mechanical nature. It would be well to investigate the feed and methods of feeding. Ground barley—improperly threshed—fed in self-feeders may give rise to conditions similar to those described. Often when barley is threshed while damp a large percentage of beards will remain with the grain. The beards are usually broken during the process of grinding, but the remaining fragments are readily capable of inhalation by a hog eating from a self-feeder.

That the barley beards were the chief offenders has been proven to our satisfaction in a number of instances merely by discontinuing the use of barley as a feed or feeding it in the form of slop. When this was done the trouble subsided in a short time.

B. J. KILLHAM.

Adrian, Mich.

SOME FACTS ABOUT MILK

The National Commission on Milk Standards, which met in Chicago in December last, has issued a report giving the following conclusions as being the judgment of the commission on the points presented:

It was found that the price of milk to the consumer from 1914 to 1918 has increased from 50 to 100 per cent. That while the quantity of milk consumed has fluctuated in the cities from which reports were received, yet generally at the present time it is not less than the normal or usual supply.

It is also noted that there has been an improvement in infant mortality and a lessening of diarrheal diseases among children under two years, and that this improvement has not been checked by the advance in the price of milk during the last four years.

Evidence was also presented showing the serious increase of under-nourishment among children of school age, due in the opinion of the commission to improper dieting, to some extent to poverty, and to a much larger degree to the lack of appreciation or knowledge on the part of parents as to the nutritive value of milk as compared with other foods.

The commission also concludes that the proportionate increase in the prices of other foods has been greater than the increase in the price of milk. And that at the present retail prices milk is the best and the most economical animal food that can be purchased.

Investigations and the results of experiments in the nutritive value of foods have shown that satisfactory nutrition is to be secured only through the employment of certain combinations of foods. These investigations and experiments show that milk, eggs and green, leafy vegetables are so constituted as to correct, when taken in liberal amounts, the deficiencies from a dietary standpoint of the cereal products, peas, beans, tubers, edible roots and meats. And since good nutrition cannot be secured on diets from which milk, eggs and leafy vegetables are excluded, it is of the greatest importance that the use of these classes of foods be increased rather than diminished.

OURS TO KEEP THE FAITH

Our soldiers are doing their part. It is our task to finish this work. They showed us the way and passed on—perhaps to new worlds to conquer. The solemn obligation to finish their work has fallen upon us.

"If you break faith with us who die,
We shall not sleep—though poppies bloom in
Flanders fields."

A FEW CASES OF TRAUMATIC PERICARDITIS IN COWS*

As every veterinarian knows, pericarditis of traumatic origin is not rare in the bovine; every veterinary practitioner who has practiced for any length of time has met such cases and is more or less familiar with the disease.

It is not my intention to offer anything new or startling upon the etiology, diagnosis or treatment of this condition, but to simply enumerate symptoms observed and to compare the cases with our classic symptom-complex of the disease described as typical by our leading textbooks on veterinary medicine.

We will first take up each case in detail with its history, symptoms, post-mortem findings, etc.

Case No. 1. On November 9, 1915, was called to a farm to castrate a colt. While there my attention was called to a grade Holstein cow that was suffering from what the owner called "dyspepsia." A rather superficial examination was made, which revealed a normal pulse, temperature and respiration. Animal thin and unthrifty in appearance, appetite small and bowel movements scanty. A diagnosis of indigestion was made and a tonic of nux vomica and gentian left to be given three times daily.

November 24, the owner called by telephone, stating that the cow's appetite had improved and that she had given birth to a calf ten days previous, after which she had steadily grown worse, until on above date she refused food altogether. I found the animal in a recumbent position, but upon urging she promptly arose to her feet.

The animal thin and weak; pulse 96; respiration 22; temperature 104.2°; diarrhea present. Percussion over the thorax caused evidences of pain and revealed an enlarged area of cardiac dullness indistinct in outline with apparent normal resonance of both lungs. Auscultation, particularly on right side, revealed a decided metallic bruit, simulating the tinkle of a bell in a pail of water, and synchronous with the heart-beat suggesting its being pericardial in origin.

The diagnosis was pericarditis, probably traumatic in origin, with unfavorable prognosis. The same treatment as before was continued at the owner's request, as he was not convinced that the diagnosis was correct. The animal died December 5, 1915, and autopsy revealed: slight edema of brisket, several gallons clear fluid in peritoneal cavity, abdominal organs apparently normal. The thoracic cavity contained several quarts of clear fluid; lungs apparently normal except for a few adhesions to pericardium. The pericardium was tremendously enlarged, and upon incision found filled with yellow fluid pus of a very foul odor. The pericardial wall measured 1.5 inches in thickness at one point where it was adherent to the diaphragm. The reticulum was also adherent to the abdominal side of the diaphragm in the same region. No foreign body traversed this area of adhesion nor was any found in the pericardial cavity. The epicardium was roughened, eroded and of a cooked appearance, which extended fully half the distance through the myocardium. Careful search failed to reveal a foreign body. It may have been pushed back into the reticulum after wounding the pericardium and infesting it, or been disintegrated within the pericardium. *Diagnosis*: Purulent pericarditis, probably of traumatic origin.

Case No. 2. July 29, 1916, called at farm to see ailing grade Holstein cow. The history showed that animal had been ailing and off feed for a few days with scanty bowel movements. No history of previous attacks of indigestion.

Symptoms: Animal in good thrifty condition. In fact, fat for an ordinary dairy cow; pulse, 50; respiration, 20; temperature, 102.8°. Rumination absent; auscultation over abdomen revealed occasional peristaltic sounds; auscultation of thorax revealed no abnormal sounds.

Diagnosis: Indigestion. Purge of epsom salts given with nux vomica, gentian, etc., left to be given by owner as a stomachic tonic.

On July 31, 1916, saw patient again, when she appeared much the same as at the previous visit, except that she looked sicker. Temperature, 103.2°. Animal had passed, shortly before my arrival, a mass of feces covered with what appeared to be a croupous membrane. A thorough and careful examination of the thorax was negative. Same diagnosis as at previous visit with unfavorable prognosis.

Post-Mortem: Death occurred August 3, 1916. No subcutaneous edema, abdominal organs normal except for a few areas of redness (mild enteritis) of small bowel. Considerable clear fluid in abdominal cavity. Reticulum adherent to diaphragm over an area several inches in diameter. Thoracic cavity contained a quart or so of clear fluid; pericardium slightly enlarged and adherent to diaphragm. Incision of the pericardium revealed thick yellow pus and a piece of wire six inches in length piercing the organ from the reticulum. Myocardium eroded and yellow in appearance; section showed a necrosis extending for a considerable distance into the parenchyma of the organ.

Diagnosis: Traumatic pericarditis.

Case No. 3. On November 29, 1916, my partner, Dr. Downing, was called to the same farm to see a pure-bred Holstein cow. On leaving the office I jokingly mentioned pericarditis to him, recalling my experience at the same place some three months previous.

History: Previous attacks of indigestion.

Symptoms: General condition good. Temperature, 103.2°; bowel movement stopped; appetite gone. Careful examination of the thorax

*Paper presented at January, 1919, meeting of Wisconsin Veterinary Medical Society.

failed to reveal any abnormal sounds of lungs or pericardium.

Diagnosis: Indigestion with the usual treatment (oil, nux vomica, etc.).

Post-Mortem: December 3, 1916. No subcutaneous edema. Abdominal organs apparently normal, except for an area of adhesion of reticulum to diaphragm. Through this area a piece of wire 8 inches in length passed, piercing the pericardium. The pericardial cavity contained a small amount of foul-smelling black fluid and gas. Pericardial wall thickened and visceral surface covered with black fibrinous shreds: Myocardium covered with similar shreds, giving it a woolly appearance. There were large collections of fluid in abdomen and thorax. *Diagnosis*: Traumatic pericarditis.

Case No. 4. On July 11, 1918, called at a farm to post a cow that had died of malignant catarrhal fever. Attention was called to an Ayrshire cow that had been taken sick since last visit four days previous. No history of previous indigestion.

Symptoms: Temperature, 106.2°; respirations accelerated; pulse weak but regular; appetite gone. Right side of thorax showed an area of dullness, but no abnormal sounds of definite nature were heard on auscultation. On account of the prevalence of malignant catarrhal fever in this herd I was suspicious of this animal suffering from it, i. e., showing the prodromal symptoms, although the only symptom she had in common with the disease was a high temperature (no eye or nasal symptoms). Animal visited on following day in consultation with a veterinarian of the Department of Agriculture, who hazarded a diagnosis of impaction of the third stomach. The symptoms were much the same as at previous visit (temperature 105.2°). On July 15th animal was seen again, at which time splashing sounds could be heard emanating from the thorax in the region of dullness noted at first visit. These sounds were evidently pericardial in origin. The animal was weaker than at the previous visit and breathing hard. Exploratory puncture of the thorax was made, but no fluid obtained, thus eliminating hydrothorax. *Diagnosis*: Pericarditis, but hardly suspected it to be traumatic in origin, for I was still in doubt about atypical catarrhal fever.

Post-Mortem: Animal died July 8, 1918. A wire about six inches long and two nails pierced the wall of the reticulum, diaphragm and pericardium. Pericardial sac distended about six times its normal size, extending from one chest wall to the other; a large area was in intimate contact with right thoracic wall and adherent to it. The pericardium contained about two gallons of thin pus mixed with disintegrated blood and curdy material (inspissated pus). Large amounts of fluid in both body cavities. The myocardium showed crosions with fibrin collections. *Diagnosis*: Traumatic pericarditis.

Case No. 5. On September 17, 1918, was asked advice by telephone regarding grade Holstein cow with swelling in the region of the brisket, thought by the owner to be due to bruise from stanchion in lying down. Advised hot fomentations and liniment to part and surgical intervention when fluctuation appeared. On September 21, 1918, owner requested visit.

History: Revealed previous attacks of indigestion.

Symptoms: Animal emaciated, appetite gone, buttocks and tail soiled by liquid feces, large edematous swelling in region of brisket extending posteriorly to region of xyphoid cartilage, edema of the throat. Temperature, 102.5°; respirations shallow and slightly accelerated; pulse imperceptible. Thorough examination of the thorax failed to reveal any abnormal sounds. In fact, the heart beat could not be heard by the ear or phonendoscope. Upon explanation to the owner of possible nature of the trouble he volunteered the information that a few days previous he had heard distinct splashing sounds in the thorax, different from any sounds he could get from normal cows in his herd.

Diagnosis : Traumatic pericarditis.

No treatment and post-mortem requested when animal died.

Post-Mortem: Animal died September 25, 1918. Subcutaneous edema of brisket and throat. Abdominal cavity contained fully a washtubful of thin, clear fluid, reticulum adherent to diaphragm over area of about eight square inches; thorax contained considerable fluid. The pericardial sac was immensely distended with fluid and adherent to both lungs and diaphragm. On incision fully four gallons of purulent material escaped and revealed a badly eroded heart, greenish-yellow in color. A piece of wire four inches long penetrated the wall of the reticulum, diaphragm and pericardium.

Diagnosis: Traumatic pericarditis.

Case No. 6: Called at farm to see ailing Guernsey cow.

History: Aborted several months ago and had been ailing off and on since, steadily getting thinner. Symptoms described by attendant rather indefinite, but in main those of indigestion.

Symptoms: Animal thin, still eating a little; temperature, 103.3°; pulse accelerated; auscultation over thorax just posterior to elbows revealed distinct splashing sounds.

Diagnosis: Pericarditis and advised slaughter.

On October 9, 1918, saw patient while making a call at farm to see cow suffering from acute pharyngolaryngitis, at which time she showed weakness, pericardial bruits and edema of brisket and ventral part of thorax. First diagnosis verified and slaughter again advised.

Post-Mortem: Animal died October 11, 1918. Pericardial sac immensely distended, occupying greater portion of thoracic cavity, pushing lungs

toward dorsal wall of that cavity. Pericardium adherent to lungs, diaphragm and lower half of parietal pleura. A thick, fibrous band of connective tissue extended from the reticulum, through the diaphragm and attached to the pericardium. On incision of this band a chocolate colored fluid escaped—coming from the pericardium—showing it to be a fistulous tract extending from the reticulum to the pericardium. No wire or other foreign body traversed this tract. The myocardium and parietal pericardium had a greenish-yellow cauliflower appearance. Fibrous pericardium tremendously thickened and cavity contained fully two gallons of thick chocolate colored fluid. Large amounts of fluid in abdomen and thorax.

Diagnosis: Traumatic pericarditis. Although foreign body was not found the fibrous fistulous tract was evidence enough that it had once been present.

Case No. 7. On October 19, 1918, owner called at office for medicine for Holstein cow. Symptoms described by him those of indigestion. Epsom salts, barium chlorid and tartar emetic given him. On November 6, 1918, visited his farm to see cow suffering from acute mastitis, at which time the owner called attention to cow for which he had obtained medicine on October 19th. He stated that she had improved on administration of purgative, appetite improved, but was now in the same condition as before.

Symptoms: Thin; temperature, 102.8° bowel movements scanty; appetite gone; rumination absent; peristaltic sounds inaudible. Auscultation over the thorax revealed no abnormal sounds of lung or heart.

Diagnosis: Indigestion.

Treatment: Oil, barium chloride, tartar emetic and nux vomica.

On November 11, 1918, owner requested return call.

Symptoms: More gaunt than before; temperature, 102.6°; pulse 60. Both sides of chest revealed dullness and abnormal heart sounds, rather indistinct. There was no subcutaneous edema of pendent parts.

Diagnosis: Probable pericarditis. Same treatment as before.

Post-Mortem: Animal died November 23, 1918. Large edematous swelling in regions of brisket and slight edema of throat. Reticulum adherent to diaphragm. Large amount of clear fluid in peritoneal cavity. Right lung adherent to diaphragm and parietal pleura at lower third of all lobes. Firm adhesions of right lung to pericardium. Approximately one quart of fluid in thorax. Pericardium thickened and contained approximately fourteen quarts of foul brownish fluid mixed with chunks of inspissated pus. Myocardium eroded, greenish yellow in color and adherent to pericardium at apex. Piece of curved wire about four inches long passed through fibrous fistulous tract leading from reticulum, through diaphragm and into the pericardial cavity.

Diagnosis: Traumatic pericarditis.

We have taken up symptoms as they appeared in each individual case. Let us now look at our typical symptom-complex of traumatic pericarditis, as described by leading authorities on veterinary medicine. I have carefully gone over the standard textbooks* and their typical symptoms complex may be summarized as follows:

1. Repeated or previous digestive disturbance (traumatic gastritis).
2. Accelerated and later weakened pulse and heart beat.
3. Cardiac dullness (increased area).
4. Pericardial bruits (friction sounds, splashing, tinkling, etc.).
5. Subcutaneous edema.
6. Temperature elevated more or less.

I have prepared a table showing which, if any of the above mentioned symptoms, appeared in each case. It should be remembered, however, in justice to our text writers that all recognize atypical cases.

Study of the table reveals the following striking points:

1. The uniform conformation of nearly all the cases to our typical symptom-complex.
2. The two symptoms that show the greatest variation are temperature and subcutaneous edema.
3. The only cases where ante-mortem diagnosis is at variance with the post-mortem are those cases, Nos. 2 and 3, in which the heart bruits were absent. Both of these animals were in good flesh, which may have acted as a muffler to prevent pericardial sounds being transmitted to ear on auscultation. However, it should be borne in mind that the bruits may have appeared and have disappeared by time of exam-

*Hutyra and Marek, Path. and Therap. of Dis. of Domestic Animals, Vol. I, p. 1124.
E. Frohner, Komp. d. Spec. Path. und Ther. fur Tierarzte, p. 31.
E. Wallis Hoare, System of Vet. Medicine, Vol. II, p. 1102.
Friedberger and Frohner, Veterinary Pathology by Hayes, Vol. I, p. 412.

TABLE OF SYMPTOMS AND DIAGNOSIS

Case	Previous Indigestion	Hastened or Weak Pulse	Cardiac Dullness	Heart Bruits	Temperature Elevated	Subcutaneous Edema	Ante Mort. Diag. Verified by P. M.
1	Yes	Yes	Yes	Yes	Yes 104.4	Slight	Yes
2	No	No	Not percussed	No	Yes 103.2	No	No
3	Yes	No	Not percussed	No	Yes 103.5	No	No
4	No	Yes	Yes	Yes	Yes 106.2	No	Yes
5	Yes	Yes	Yes	Yes	No 102.5	Yes	Yes
6	Yes	Yes	Yes	Yes	Yes 103.2	Yes	Yes
7	Yes	Yes	Yes	Yes	Yes 102.6	No	Yes

ination, as shown by case No. 5. Could daily visits have been made over a period of time it might have been possible to have secured bruits in all cases.

4. Pericardial bruits are pathognomonic of the disease.

5. However, with bruits absent and other tymptoms (previous indigestion, weak pulse, cardiac dullness, subcutaneous edema, etc.), present one can make a fairly good guess as to the nature of the trouble and the client's information as to the indications.

HERBERT LOTHE.

Waukesha, Wis.

BOOK REVIEWS

General Bacteriology

By Edwin O. Jordan, Ph.D.,

Professor of Bacteriology, University of Chicago and Rush Medical College. Sixth Edition. Pages, 681. Illustrated. Published by the W. B. Saunders Co., Philadelphia, Pa., 1918.

Jordan's Bacteriology is everywhere recognized as an authorative guide to the seeker after practical knowledge on this important branch of medical science.

This, the sixth edition, has been thoroughly revised, the chapters on "Pneumococcus" has been entirely rewritten, and that on "Meningococcus" extensively revised.

Several new sections have been added, including brief summaries of the present knowledge of infectious jaundice, ratbite fever and trench fever.

Bacteriology as related to animal diseases is dealt with at length. Texas fever, foot and mouth diseases are discussed in the chapter on "The Filterable Virus."

In the references, veterinary authorities are freely quoted, and throughout the book are many points of particular interest to the veterinarian, including the bacteriology of plants, milk and milk products, dairying, agriculture, water, food preservation; of leather tanning, vinegar-making, tobacco-curing; of household administration and sanitary engineering. A chapter of prime importance to all students of botany, horticulture and agriculture is that on the bacterial diseases of plants.

The work is well illustrated, in good clear type on exceptionally good paper, and substantially bound, making it a worthy addition to any scientific library, at the same time being in simple every day language comprehensible to the man of average intelligence.

Atlas of the Viscera, in Situ, of the Dairy Cow

By Grant Sherman Hopkins.

Professor, New York State Veterinary College, Cornell University, Ithaca, N. Y. Pages, 44. Published by the Macmillan Co., New York. Price, $1.75.

An accurate knowledge of topographic anatomy, especially of the location and relations of the digestive, respiratory and genito-urinary organs, is becoming daily more essential to the veterinarian and stock owner. To meet this need this atlas has been carefully prepared. It contains a concise and graphic exposition of these organs and their relations with other organs. The drawings were made from photographs supplemented by direct observations and measurements of the specimens.

The utmost care was taken to avoid displacements of the organs in preparing the specimens, though mention is made of the fact that identical relations of parts in any two specimens are not to be expected. Nine full page plates, some in colors, are accompanied by full descriptions and explanatory notes and suggestions. Both the abdominal and the thoracic viscera are included.

WANT UNIFORM SHIPMENT LAWS

A meeting was held recently in Chicago, called by President E. C. Brown, of the Chicago Live Stock Exchange. Members of the Omaha, Louisville, St. Paul, Sioux City, Indianapolis, Buffalo, St. Joseph (Mo.) and Chicago live stock exchanges were present, together with veterinarians from the Bureau of Animal Industry and state veterinarians from Ohio, Wisconsin, Indiana, Illinois, Kentucky, Iowa and prominent representatives of live stock associations and agricultural colleges.

The object of the meeting was to discuss plans to eradicate tuberculosis.

It was the unanimous opinion of the stock men that rules and regulations lack uniformity. It was pointed out that the lack of uniformity in the rules and regulations in the various states governing interstate shipment forced hardships on the stockmen all over the country and caused a tremendous reduction in the feeding and breeding of live stock for the last year. It was urged that all state laws, rules and regulations be in conformity with the federal regulations, so as not to interfere with the interstate movement of live stock at state lines. A number of resolutions were passed.